# Playa Drain

| Description | Date | Field Book |
|---|---|---|
| Traverse (0+00 / 566+00) | 3-5/20 | 1929 |
| Profile (After Cleaning, 0+00 / 521+52) | 12/47 | 2103 |
| Profile (Culvert Install., Sta 164+63) | 10/49 | 2103 |
| Profile (Culvert Install, Sta 186+57 / 192+00) | 9/50 | 2103 |
| X-Sec (Lake Side Sub-Div.) | 2/53 | 2103 |
| Flume & Bridge Loc. (17+20 / 20+29) | 7/49 | 2107 |
| Profile & X-Sec (44+00 / 570+00) | 6/52 | 2127 |
| ROW (Vsleta H.S. | 7/53 | 2138 |
| ROW (Cedar Grove Park Subdiv.) | 6/54 | 2138 |
| Profile (Little Flower Rd, 0+00 / 0+95) | 6/54 | 2153 |
| ROW (Monuments on Cedar Grove) | 10/53 | 2155 |
| Culvert Grade (Cold Inn Rd) | 1/54 | 2156 |
| X-Sec Interior (Electric Line Xing, Valley Gate) | 11/54 | 2157 |
| ROW | 7/52 | 2162 |
| ROW (Curier End) | 3/56 | 2162 |
| Profile (197+49 / 165+98) | 5/53 | 2164 |
| Profile & X-Sec (0+00 / 16+26) | 2/54 | 2166 |
| X-Sec (Backfill Quantities, 320+32 / 507-) | 11/55 | 2181 |
| X-Sec (453+88 | 3/61 | 2210 |
| Condition Profile (0+00 / 520+00) | 1/60 | 2214 |
| X-Sec (Riverside Drive Culvert, 281+95 / 213+62) | 8/60 | 2219 |
| X-Sec (406+50, B3+16, | 4/60 | 2230 |
| X-Sec (Flume Real, 265+80 ~~0+00 / 2+00~~) | 5/63 | 2279 |
| ~~X-Sec (Rio Xing, 0+44)~~ | ~~2/63~~ | ~~2290~~ |
| Levels | 11/65 | 2290 |
| X-Sec (Hidden Valley Dr. Inlet. | 2/66 | 2290 |
| Chk Elev. (Storm Sewer Inlet, Croom Rd) | 10/67 | 2303 |
| X-Sec (Croom Rd) Conc. Apron | 2/68 | 2303 |

# PLAYA DRAIN

| DESCRIPTION | | DATE | FIELD BK |
|---|---|---|---|
| PROFILE | (PROP. INLET FROM THOMAS MANOR RD.) | 4/69 | 2313 |
| X-SEC | (OLD COUNTY RD X-ING) | 10/69 | 2315 |
| X-SEC | (C.S.S. FENCE X-ING) | 1/70 | 2315 |
| X-SEC | (PROP. BRIDGE, OLD COUNTY RD.) | 3/70 | 2815 |
| B.M.'S | | NO DATE | 3-B |

# PLAYA INTARCOM DRAIN

| DESCRIPTION | | DATE | FIELD BOOK |
|---|---|---|---|
| CULVERT SEC | (STA 362+77) | 6/50 | 2115 |
| FLUME & GRADE | (CHORIN FLUME) | 5/53 | 2165 |
| X-SEC | (PLAYA LAT X-ING) | 11/54 | 2185 |
| X-SEC | (RIVERSIDE DRIVE CULVERT, 235+42/237+13) | 8/60 | 2219 |
| X-SEC | (NEW CULVERT | 9/63 | 2222 |
| CONDITION PROFILE | (0+00/367+00) | 2/60 | 2225 |
| X-SEC | (55+55), [redacted], [redacted] | 4/60 | 2230 |
| X-SEC | (181+84 & 219+12) | 5/61 | 2230 |
| X-SEC | (FLUME, 33+92, 57+98, 40+50) | 5/60 | 2232 |
| X-SEC | (AR X-ING, 0+43 & 253+50) | 2/63 | 2268 |

PLAYA LATERAL

| DESCRIPTION | DATE | FIELD |
|---|---|---|
| LEVELS (STA 174+00 / 242+36) | 9/75 | 56 |
| LEVEL CHECK FOR BRIDGE (STA 228+45) | 6/72 | 1921 |
| PROFILE, (PARSHALL FLUME, 166+66 / 27+60) | 3/47 | 2090 |
| CONSTANT HEAD ORIFICE - TURNOUT (STA 228+30 / 2147) | 5/48 | 2104 |
| PROFILE (EPCID #1 CULVERT X-ING | 6/49 | 2108 |
| PROFILE (BRIDGE ELEV., 215+07 / 238+35) | 2/50 | 2104 |
| CONCRETE LINING PATS | 2/50 | 2112 |
| PROFILE (CULVERT INSTALL.) | 2/51 | 2122 |
| PROFILE (WALCOTT FLUME X-ING) | 1/51 | 2122 |
| PROFILE (191+12 / 206+43) | 1/51 | 2122 |
| BM (0+00 / 34/+75) | 5/60 | 2153 |
| X-SEC (3+61) | 4/53 | 2165 |
| LOC. | 4/54 | 2169 |
| X-SEC (SEWER LINE X-ING, 150 / 12 B) | 2/56 | 2178 |
| ~~X-SEC~~ X-SEC (SEWER X-ING | 3/56 | 2183 |
| PROFILE (167+00/227+00, PROP. CULVERT FOR PERCHER) | 2/56 | 2184 |
| TRAVERSE | 3/55 | 2189 |
| X-SEC (CHK REPLACE. | 5/61 | 2223 |
| ELEV. CHK. (CULVERT,) | 3/63 | 2226 |
| PROFILE (0+00 / 315+31) | 5/60 | 2237 |
| X-SEC (314+92, CHK REPL.) | 6/60 | 2238 |
| X-SEC (3+11 / 31+02) | 12/61 | 2290 |
| X-SEC (NEW CULV. 18+03 ; 328+44, CHK REPL.) | 12/61 | 2290 |
| X-SEC (CHK REPL., 119+12) | 2/62 | 2287 |
| X-SEC (NEW CHK INSTALL., 100+67) | 1/63 | 2298 |
| X-SEC (72+00 / 340+50) | 1/65 | 2301 |
| SIPHON SEC (DELTA FT, SIPHON) | 12/20 | 2310 |

# PORTER LATERAL

| ESCRIPTION | | DATE | FIELD BOOK |
|---|---|---|---|
| LEVELS | (704+50 ARMIJO LAT. / 123+60 A. LAT.) | 8/73 | 1044 |
| ELEV'S | (AERIAL PHOTO; 5+63 / 15+32) | 4/74 | 1071 |
| FINAL ELEV'S | (0+00 / 23+26) | NO DATE | 1010 |

# PRESCOTT SPUR DRAIN

~~Spur "A" Drain~~

**Bosque** ~~Secco~~ ~~Hwy~~

| SCRIPTION | DATE | FIELD BOO |
|---|---|---|
| ~~Hwy Transverse (Colod/76150)~~ | ~~4/26~~ | ~~1554~~ |
| ~~Culvert (Gunder Hwy)~~ | ~~6/26~~ | ~~1750~~ |
| ROW | 2/27 | 1951 |
| ROW | 9/30 | 2024 |
| Struc. Inventory | 4/57 | 2057 |

[redacted]

Price Spur Drain

| DESCRIPTION | DATE | FIELD BOOK |
|---|---|---|
| ROW (CHAINED) | 12/30 | 2010 |
| STRUC. INVENTORY | 4/31 | 2057 |

# PROPECK LATERAL

| :SCRIPTION | DATE | FIELD BOOK |
|---|---|---|
| ELEVATIONS (AERIAL PHOTO H 174; 12403/19429 | 10/13 | 1050 |
| LOCATION & REVOCATION (0402/60456) | 3/24 | 1581 |
| USAR SEC LINE TIE | 3/28 | 1581 |
| LOCATION | 3/28 | 1581 |
| PROFILE & INFO. | 3/28 | 1581 |

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| 177 | QUESENBURY LATERAL |
| 178 | QUESENBURY LATERAL WASTEWAY |

## QUEMADA LATERAL

| SCRIPTION | | DATE | FIELD BOOK |
|---|---|---|---|
| TRAVERSE & TIE | (STA 0+55/STA 46+14) | 4/75 | 122 |
| CROSS-SECTIONS | (0+55/46+14) | 4/75 | 122 |
| STR. ELEVATIONS | (0+55/46+14) | 4/75 | 122 |
| R.P's | | 9/76 | 203 |
| PROFILE | (0+00/51+81 | 10/59 | 2201 |
| X-SEC | (BRIDGE REPLAC. 22+92) | 4/61 | 2201 |
| X-SEC | (W.W. REPL., 45+73/47+08) | 1/63 | 2252 |
| X-SEC | (CHK IMPROV., 24+41, 33+73) | 7/62 | 2297 |
| PROFILE | (WITH OVERFLOW, 51+80) | 6/69 | 2316 |

## QUESENBURY LATERAL

| ESCRIPTION | DATE | FIELD BO |
|---|---|---|
| LEVELS (78+09 LAS CRUCES LAT/ 91+38) | 8/73 | 1039 |
| ELEVATIONS (AERIAL PHOTO # 48; 83+84/ 91+33) | 10/73 | 1058 |
| ELEVATIONS (AERIAL PHOTO # 47; 114+40/121+74) | 11/73 | 1053 |
| TIE (FROM 1/4 BET. SECS 1 & 12 T23S R1E) | 4/19 | 1589 |
| CULVERT UNDER MESILLA CANAL - INVESTIGATION | 2/54 | 1689 |
| HIGH WATER FOR FARM DITCH - FLOOD OUTFALL CL. , STA 46+30 | 5/75 | 1954 |
| X-SECT (ADLER FEATHERS PUMP PERMIT, 86+38) | 1/64 | 1955 |
| CHK & CULVERT (STA 66+33 | 5/52 | 2075 |
| FINAL ELEV'S (0+00/ 98+00) | NO DATE | 1007 |

QUESENBERRY WASTE WAY

| :SCRIPTION | DATE | FIELD BOOK |
|---|---|---|
| FLUME INFORMATION (COVER DEL RIO DRAIN) | 6/32 | 1977 |

R

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215 RODRIGUEZ DRAIN
216 RODRIGUEZ LATERAL
217 RODRIGUEZ SOUR DRAIN
218 ROSEDALE COMM. DITCH #1
219 ROWLEY LATERAL

RAE LATERAL

| DESCRIPTION | | DATE | FIELD BOOK |
|---|---|---|---|
| PROFILE | (0+00 / 50+00) | 2/20 | 1651 |
| CUTS | (0+00 / 42+86) | 12/20 | 1651 |

# RAE LATERAL EXTENSION

| DESCRIPTION | DATE | FIELD BOO |
|---|---|---|
| PROFILE (42+80 / 48+00) | 1/21 | 1651 |

# RAYMOND LATERAL

| SCRIPTION | | DATE | FIELD BOOK |
|---|---|---|---|
| LEVELS | (501+56 EAST SIDE Canal / 10+04) | 11/73 | 1055 |
| LEVELS | (RERUN DUE TO RELOCATION OF CMK. TBM-118-1) | 4/74 | 1073 |
| ELEV'S | (AP. 22+14 / 22+24) | 5/74 | 1077 |
| CROSS-SECTIONS | (AT STA 10+04) | 1/73 | 1516 |
| FINAL ELEV'S | (0+00 / 10+04) | NO DATE | 1010 |

# READ LATERAL

| DESCRIPTION | | DATE | FIELD BK |
|---|---|---|---|
| LEVELS | (11+45 DUPSENBURY / 24+94 ARMUD.) | 8/73 | 1034 |
| ELEVATIONS | (AERIAL PHOTO # 47; 11+44 / 28+05) | 10/73 | 1053 |
| INVEST. PROFILE | (0+00 / 34+00) | 7/23 | 1580 |
| GILMER PROP | LAND INVEST. (STA 26+62) | 8/67 | 1952 |
| RELOCATION | | 3/50 | 2029 |
| FINAL ELEVS | (0+00 / 28+00) | NO DATE | 1007 |

# Rigney Sour Drain

| DESCRIPTION | DATE | FIELD BC |
|---|---|---|
| Profile (Change) | 1/55 | 2033 |

# Rigney Drain

| DESCRIPTION | DATE | FIELD BK |
|---|---|---|
| ROW (CHAINED) (0100/6B/00) | 10/30 | 2063 |

RINCON AREA

| SCRIPTION | DATE | FIELD BOOK |
|---|---|---|
| SPERLICH CLASSIFICATION, 1926 CLASSIFICATION | 5/26 | 1552 |

# RINCON CANAL

## ~~LAS CRUCES~~ LATERAL (UPPER REACH)

| SCRIPTION | DATE | FIELD BOOK |
|---|---|---|
| ~~ELEVATIONS (FINAL, LINE) S3 & S4~~ | ~~NO DATE~~ | ~~1006~~ |
| LEVELS (FROM LOOP #27 TO LOOP #30) | 4/73 | 1018 |
| ELEVATION) DEV - 1HH-133 | 6/73 | 1029 |
| ELEVATIONS (FINAL, STA 1382+22/STA 1764+58) | 5/73 | 1030 |
| ELEVATIONS (DEV-1HH-135, STA 1340+58) | 6/73 | 1033 |
| ELEVATIONS (DEV-1HH-134, 132, 131 & 129, STA 1340+48/1348+12 | 6/73 | 1034 |
| STA 1512+61, 1547+84/1605+49, & 1458+56/1760+64) | ~~6/73~~ | |
| HIGH WATER ELEVATIONS (STA 1231+90/STA 1571+44) | 6/73 | 1035 |
| LEVELS (RE-RUN, LOOP F # 30 & #29) 1413+09/US & GY-246 | 5/73 | 1041 |
| CROSS-SECTIONS (1196+45/1764+30) | 5/75 | 1098 |
| LOCATION SURVEY (~~1700~~ 1395+76/1570+87) | 12/25 | 1960 |
| X-SECTION FOR RITCH BREAK (1316+92) | 5/68 | 1623 |
| RELOCATION | 1/52 | 1799 |
| LEVELS | 4/52 | 1801 |
| HAYNER RELOCATION & PROFILE | 2/56 | 1801 |
| PROPOSED NEW & LOCATION | 6/48 | 1865 |
| PROFILE | 6/47 | 1868 |
| RINCON RIO & PROFILE | 6/47 | 1868 |
| PROFILE (FOR GARY CHECK) | 6/50 | 1868 |
| PROFILE (GARY CHANGE) | 11/48 | 2017 |
| CHANGE | 3/49 | 2069 |
| COMBINED TURN OUT CULVERT-FLUME (STA. 1396+87, 1547+63 | 5/52 | 2075 |
| HEADWALL CHK (STA 1605+92) 1627+60) | 5/52 | 2075 |
| FINAL ELEVS (UPPER REACH) | 12/72 | 1013 |

# Rincon Canal Extension

| :SCRIPTION | DATE | FIELD BOOK |
|---|---|---|
| WW Structure | 10/26 | 1972 |
| Preliminary Lines Loc. | 10/26 | 1972 |
| Final Loc. (1569+91/1744+49 | 5/27 | 2037 |
| Profile (1669+91/1767+39) | 5/27 | 2047 |
| Profile (WW Struc. Info) | 10/27 | 2047 |

# RINCON DRAIN

| DESCRIPTION | DATE | FIELD BOOK |
|---|---|---|
| LOCATION SURVEY (TEST WELLS) | 6/26 | 1557 |
| LOCATION SURVEY (298+00/360+19) | 10/25 | 1560 |
| LOCATION, SURVEY (0+00/298+23; RELOCATION) | 12/25 | 1560 |
| INVESTIGATION (RUNNING N.E. STA 318+82) | 11/25 | 1570 |
| INVESTIGATION (BRIDGE SEC., STA 49+55 & STA [illegible], STA 42+10) | 1/26 | 1570 |
| X-SECTION & PROFILE OF FLUME REPLACEMENT (205+21) | 10/63 | 1624 |
| PROFILE - SOUTH BRANCH (526+50/556+30) | 12/58 | 1750 |
| PROFILE (0+00/18+10) | 3/62 | 1750 |
| PROFILE - NORTH SPOIL BANK (201+00/243+00) | 10/25 | 1751 |
| PROFILE (300+00/381+00) | 11/25 | 1751 |
| PROFILE (FOR HAYNER RELOCATION) | 2/56 | 1802 |
| SECTION FOR GRAY & ARCHER FLUME | 3/40 | 1896 |
| ROW TRAVERSE (DRAIN COMP.) | 3/51 | 1879 |
| X-SEC (CULVERT Y-ING REPLACEMENT, 431+60) | 1/69 | 1959 |
| PROFILE (WATER SURFACE) | 9/50 | 2062 |
| ~~HANSEN TRAIL TRUSS~~ (RINCON | | |

~~Tonuco~~ Drain

Rincon Drain Tonuco Extension

| SCRIPTION | DATE | FIELD BOO |
|---|---|---|
| Final & New Location (0+00 / 170+30) | 6/27 | 1562 |
| Cross-Sections (Cuts & Grade Level) 0+00 / 172+07 | 3/30 | 1562 |
| ~~Profile (0+00 / 104+13)~~ | ~~12/30~~ | 1750 |
| ROW Traverse | 3/31 | |

# RINCON LATERAL

## ~~MESILLA LATERAL (UPPER REACH)~~

| DESCRIPTION | | DATE | FIELD BOOK |
|---|---|---|---|
| ~~ELEVATIONS~~ | ~~(FINAL, LINE 51)~~ | ~~NO DATE~~ | ~~1006~~ |
| ~~TIE~~ | ~~(TO USCE 65 U-24)~~ | ~~" "~~ | ~~1006~~ |
| LEVELS | (LOOP # 30) | 4/73 | 1018 |
| LEVELS | (LOOP #41, STA 1571+38/STA 1764+38) | 5/73 | 1028 |
| ELEVATIONS | (FINAL, STA 1542+22/STA 1764+38) | 5/73 | 1030 |
| ELEVATIONS | (OEV-1HH-1825'183, STA 1693+94) | 6/73 | 1033 |
| HIGH WATER ELEVATIONS | (STA 1588+92/STA 1764+38) | 6/73 | 1035 |
| R.O.W. | (1430+03/1370+50) | 4/26 | 1570 |

# RINCON LATERAL "C"

| SCRIPTION | DATE | FIELD BOO |
|---|---|---|
| TRAVERSE (IN CONNECTION WITH N. BRANCH OF RINCON PARK) | 10/51 | 1565 |
| STR. (RINCON CANAL CROSSING, SLA (L8S+04) | 3/55 | 1990 |

# Rincon Lateral "M"

| SCRIPTION | | DATE | FIELD BOO |
|---|---|---|---|
| Levels | (0+00 EPBM-30-31 To Rincon Canal Sta 15/3906) | 5/73 | 1028 |
| Elevations | Final, 11+82/29+50 | 5/73 | 1030 |
| Elevations | (Dev-1H/H-181, Sta 24+59) | 6/73 | 1034 |
| Location Survey | (0+00/69+70) | 12/75 | 1560 |
| ROW | (0+85/69+74) | 4/26 | 1570 |
| Levels | (Along East Side) | 1/55 | 1772 |

# Rincon Siphon

| DESCRIPTION | DATE | FIELD BOO |
|---|---|---|
| Angles & Cross-Sections | 10/69 | 1513 |
| Pump & Mets Info for EB10 | 7/60 | 1791 |
| Info. | 2/51 | 1814 |

# RINCON VALLEY (DISTRICT)

| SCRIPTION | DATE | FIELD BOO |
|---|---|---|
| SUBDIVISIONS & TRAVERSES FOR NEW MAP "D" | | |
| CASARES & OTHERS SUBD. | 9/32 | 1540 |
| PARRA JOSE SUBD. | 9/32 | 1540 |
| MAP OF HILL LINE | 9/32 | 1540 |
| DOÑA ANA SIERRA CO. LINE HWY. TRAVERSE (EAST WEST FROM PERRY) | 5/34 | 1540 |
| SYKES RD. TRAVERSE | 5/34 | 1540 |
| ARREY (LOCATIONS) | 6/35 | 1540 |
| RIVER TRAVERSE (NORTH SIDE OF RIVER, 0400/4777 FEET) | 11/26 | 1555 |
| REF NEW MAP H DATA: | | |
| RINCON ARROYO TRAVERSE | 7/35 | 1714 |
| SEMANIEGO RD. TRAVERSE | 8/35 | 1714 |
| BORGANOT RD. TRAVERSE | 8/35 | 1714 |
| LIMIT OF IRRIGATION | 9/35 | 1714 |
| BLOOMYARD PROPERTY TRAVERSE | 9/35 | 1714 |
| HOLBROOK NORTH LINE TRAVERSE | 9/35 | 1714 |
| NEW MAP H DATA: | | |
| RINCON RIO RD. TRAVERSE | 7/35 | 1715 |
| RINCON-HATCH HWY TRAVERSE | 8/35 | 1715 |
| BRAZEAL NORTH LINE TRAVERSE | 9/35 | 1715 |
| BORRANOT S. LINE TRAVERSE | 9/35 | 1715 |
| NEW MAP "H" DATA RINCON & ARROYURA DISTRICT: | 8/35 | |
| LIMIT OF IRRIGATION | 8/35 | 1719 |
| USRS SECTION LINE (REESTABLISHM) | 8/35 | 1719 |
| BARREL-BIGNEL-SMITH-BORRANOT PROP. TRAVERSE | 9/35 | 1719 |
| BARKER-SMITH PROP. TRAVERSE | 9/35 | 1719 |
| RINCON CLASSIFICATION 1927: | | |
| JOHN SYKES LIMIT OF IRRIGATION | 9/27 | 1922 |

RINCON VALLEY

~~Hart Tank~~

| DESCRIPTION | DATE | FIELD BOOK |
|---|---|---|
| ~~TRAVERSE~~ (~~OFF~~ A.T.&S.F. Ry. Loc.) | 3/30 | ~~B-08~~ |
| LAND CLASSIFICATION INVEST. | 5-6/25 | 8-B & 9- |
| HEADGATES & WASTEWAYS, DRAINS FLOW | 1924 | 13-B |
| WASTEWAYS INDEX | | 21-B |
| CANALS & LATERALS INFO. | 1949-1950 | 26-B |
| SECTION LINE COMPUTATIONS (RINCON CAMP) | 1913 | 28-B |

RD CHANNEL

| SCRIPTION | DATE | FIELD BOOK |
|---|---|---|
| PROFILE (410480/533100) | 10/47 | 2098 |

# RIO GRANDE

| SCRIPTION | DATE | FIELD BOOK |
|---|---|---|
| ANNUAL CROSS-SECTION - COURSHENE BRIDGE (MESILLA VALLEY) | 1/33 | 1642 |
| - CANUTILLO ( " " ) | 1/33 | 1642 |
| - ANTHONY ( " " ) | " 4 | " |
| - MESQUITE ( " " ) | " | " |
| - MESILLA DAM ( " " ) | " | " |
| - SHALEM BRIDGE ( " " ) | " | " |
| - LOASBURG DAM ( " " ) | " | " |
| - BERINO ( " " ) | " | " |
| - TONUCO (HATCH VALLEY) | " | " |
| - NEW DETROIT ( " " ) | " | " |
| - HATCH ( " " ) | " | " |
| - GARFIELD FLUME ( " " ) | " | " |
| FLOOD CONTROL CROSS-SECTION - PICACHO FLUME | 8/33 | 1643 |
| - MESQUITE | 8/33 | 1643 |
| - ANTHONY | 8/33 | 1643 |
| - CANUTILLO | 8/33 | 1643 |
| - COURSHENE BRIDGE | 8/33 | 1643 |
| 1933 FLOOD CONTROL - HIGH WATER AT COURSHENE BRIDGE | 8/33 | " |
| - COUNTRY CLUB BRIDGE | 9/33 | " |
| - BORDERLAND HWY. BRIDGE | 9/33 | " |
| - CANUTILLO BRIDGE | 9/33 | " |
| - VINTON BRIDGE | " | " |
| - ANTHONY BRIDGE | " | " |
| - OLD ANTHONY RIO BRIDGE | " | " |
| - BERINO RIO BRIDGE | " | " |
| - VADO RIO BRIDGE | " | " |
| - MESQUITE BRIDGE | " | " |

# RIO GRANDE

## ~~RIVERTON LATERAL A~~

| DESCRIPTION | DATE | FIELD BK |
|---|---|---|
| LOCATION - PROFILES - X-SECTIONS & ALL INFO FOR RIO GRANDE NEW LEASBURG METERING STATION | 5/56 | 1762 |
| CROSS-SECTIONS (BELOW LEASBURG DAM) | 10/49 | 1763 |
| ANNUAL SECTIONS (AT LEASBURG DAM) | 10/52 | 1766 |
| ANNUAL SECTIONS (BELOW LEASBURG DAM) | 1953-1957 | 1778 |
| PROFILE (TO & DEL RIO DRAIN) | 10/63 | 1836 |
| LEVELS & BMS (FROM LEASBURG DAM TO AMERICAN DAM | 5-8/61 | 1832-183 |
| RIVER TRAVERSE (0+00 / 413+74) | 4-7/26 | 1880 |
| RIVER CROSS-SECTION (AROUND POWER PLANT) | 1/79 | 1893 |
| DETERMINATION OF % OF SILT BY WEIGHT IN SAMPLES OF WATER | 6-7/18 | 1945 |
| CROSS-SECTION (1000'N GARFIELD BR.) | 1/73 | 1941 |
| PROFILE & X-SECTION (VICINITY HATCH SYPHON) 22+80 / 40+00 | 10/14 | 1948 |
| X-SECTIONS | 1/71 | 1948 |
| GAGE INVEST. (BELOW LEASBURG DAM) | 8/49 | 1963 |
| SECTION FOR BRIDGE (TONUCO CUT-OFF) | 10/27 | 2036 |
| CROSS-SECT (FROM TONUCO LEVEE LOC. TO HERSEY LEVEE LOC) | 10/27 | 2036 |
| TONUCO CUT OFF LOCATION | 3/29 | 2037 |
| RADIUM SPRINGS INVEST. | 10/58 | 2043 |
| PROFILE (ABOVE LEASBURG DAM) | 10/58 | 2043 |
| CROSS-SECT. (0+00 [illegible]) | 10/58 | 2043 |
| 1925 RIVER TRAVERSE (EAST BANK, LOWER MESILLA VALLEY) | 12/25 | 2078 |
| CONTROL TRAVERSE & X-SEC (235+00/510+00) | 10/83 | 2091-20 |
| BENCH LEVELS (ELEPHANT BUTTE DAM TO CABALLO RESERVOIR) | 10/83 | 2092 |
| CONT RIO SECTION (BELOW R.S. CANAL HD. NO.) | 3/52 | 2125 |
| LEVELS & X-SEC (NORTH SIDE OF LEVEE, 335+00/589+28) | 4/50 | 2187 |
| WATER ANALYSIS FOR SILT & SOLUBLE SALTS | 1921 | 2326 |
| RIO GRANDE EAST & WEST BANKS TRAVERSE FROM CABALLO DAM TO SOUTH GARFIELD DISTRICT. | 10/34 | 2337 |

# Rio Grande

| DESCRIPTION | DATE | FIELD BOOK |
|---|---|---|
| 1933 Flood Control - High Water : | | |
| Fairacres Bridge | 9/35 | 1643 |
| Shalem Bridge | " | " |
| 1934 Flood - Gauges : | " | " |
| Hill NM Rock Jetty Rio Gauge (Loc. & Elev.) | 7/34 | 1643 |
| Shalem Bridge Rio Gauge (Loc & Elev.) | 7/34 | 1643 |
| 1935 Flood - Bojorquez Bridge To Courchene Bridge | 9/35 | 1643 |
| Traverse Invest. (0+00 / 475+87 & Mesilla Dam) | 1/32 | 1644 |
| East & West Bank Travers for Map & Pona Ana District | 9/29 | 1685 |
| Annual Cross-Sections (~~0+00~~ Different Sections) | 9/62 | 1688 |
| Kidder Gauge (at Percha Dam) | 1952-1955 | 1695 |
| Kidder Gauge (at Leasburg Dam) | 1952-1955 | 1696 |
| Annual 1938 Cross-Sections : | | |
| Bojorquez Bridge (0+00 / 2+50) | 12/37 | 1697 |
| Garfield Flume (0+00 / 4+58) | 12/37 | 1697 |
| Hatch (0+00 / 9+50) | 12/37 | " |
| Detroit (0+00 / 5+00) | 12/37 | " |
| Tonuco (0+00 / 4+00) | 12/37 | " |
| Leasburg Dam (0+00 / 4+12) | 12/37 | " |
| Shalem Bridge (0+00 / 2+75) | 12/37 | " |
| Mesilla Dam (0+00 / 6+00) | 12/37 | " |
| Mesquite (0+00 / 5+25 | 12/37 | " |
| Berino (0+00 / 14+69) | 12/37 | " |
| Anthony (0+00 / 5+50) | 12/37 | " |
| Vinton Canal Cut Off (0+80) | 12/37 | " |
| Canutillo (0+00 / 4+~~35~~) | 12/37 | " |
| Courchene Bridge (0+00 / 4+50) | 12/37 | " |
| Cross-Sections at Riverside Dam (0+00 / 30+00) | 2/1938 | 2346 198 |

[redacted]

Rio Interc. Drain

| SCRIPTION | DATE | FIELD BOOK |
|---|---|---|
| Former Encroachment on ROW | 10/53 | 2155 |
| Profile (Cross/End) | 6/60 | 2259 |

R 10 [redacted] LATERAL

| SCRIPTION | DATE | FIELD BOOK |
|---|---|---|
| PROFILE (0+00 / 30+67) | 1/52 | 2144 |
| PROFILE (CHK INSTALL., 20+40 / 30+00) | 3/60 | 2218 |

# Rio Rancho Lateral

| :SCRIPTION | DATE | FIELD BOO |
|---|---|---|
| ELEVATION) (AERIAL PHOTO #122, 15136) | 10/73 | 1049 |

# River Drain

| SCRIPTION | | DATE | FIELD BOOK |
|---|---|---|---|
| X-Sec | (Canal Agrias Flume crossing, sta 416+68) | 3/47 | 2096 |
| X-Sec | ( )ewel Bill Bridge Replacement) | 5/47 | 2096 |
| Grade stakes | (for Culvert): sta 416+68) | 9/47 | 2096 |
| Culvert | (sta 640+47) | 11/47 | 2100 |
| Profile | (Lt Bank, Prop. Reg. Reservoir) | 8/48 | 2100 |
| X-Sec. | (sta 51+61) | 7/49 | 2105 |
| Traverse | (Thru Smith Est.) | 4/52 | 2126 |
| Culvert Grades | (567+05/582+00) | 7/53 | 2143 |
| Gonzalez R Flume Sec | (sta 11+36 | 11/55 | 2149 |
| Culvert | | 5/54 | 2149 |
| USBR ROW | (cultivated area adj. to drain) | 2/55 | 2150 |
| Culvert Sec. | | 6/55 | 2152 |
| Bowen Flume Sec. | | 6/54 | 2153 |
| Profile | (Guerra Flume, 0/9) | 4/53 | 2165 |
| Culvert Grade | (F-157 Lat) | 5/54 | 2172 |
| Outlet Profile | (0+00/~~33+50~~ 167+00) | 10/59 | 2203 |
| Profile | (Before Cleaning, 167+00/440+00) | 10/59 | 2204 |
| Profile | (Before clean., 441+00/660+00) | 11/59 | 2206 |
| X-Sec | (Bridge Reinf., 469+66 | 5/61 | 2206 |
| X-Sec | (Bridge Replac., 108+17 | 11/62 | 2206 |
| X-Sec | (Flume Replac., 478+25) | 1/62 | 2210 |
| Profile | (Farm Ditch, 469+42) | 3/63 | 2219 |
| X-Sec | (Flume Replac., 457+30) | 3/63 | 2219 |
| X-Sec | (Bridge Repl., 98+84) | 1/63 | 2231 |
| X-Sec | (Flume Repl., 346+85) | 4/62 | 2239 |
| X-Sec | (Flume Repl., 108+36) | 3/62 | 2288 |
| X-Sec | (Bridge Repl., 130+16) | 2/62 | 2297 |

# River Sour Drain

| SCRIPTION | DATE | FIELD BOOK |
|---|---|---|
| X-Sec (Arevalo Flume | 3/52 | 2133 |
| ROW | 1/60 | 2215 |
| Levels (0+00 / 122+00) | 4/60 | 2252 |
| Profile (Slov with X-ings) | 10/68 | 2305 |

# RIVERSIDE CANAL

| DESCRIPTION | DATE | FIELD BOOK |
|---|---|---|
| METER BRIDGE | 6/81 | 1907 |
| STAFF GAGE & ELEVS | 7/81 | 1907 |
| LINING | 10/81 | 1907 |
| WW #31 (ELEV.) | 2/82 | 1907 |
| GRADES FOR LOWERIN LEFT BANK | 10/57 | 1916 |
| BRIDGE GRADES (STA 139+64) | 11/47 | 2100 |
| PROFILE (PROPOS. REG. RESERVOIR) | 8/48 | 2100 |
| ELEV'S (WINN BRIDGE) | 12/46 | 2102 |
| PROFILE ELEVES (0+00/SB7+00) | 6/50 | 2118-2120 |
| X-SEC (10+00/780+00) | 8/50 | 2121 |
| BREAK (STA 316+80) | 8/57 | 2121 |
| BOTTOM PROFILE (1+00/160+00) | 8/64 | 2121 |
| X-SEC. (224+00/525+00) | 3/52 | 2133 |
| X-SECTIONS | 9/42 | 2137 |
| ~~ALIGNMENT & PROFILE (0+00/83+00)~~ | ~~1/47~~ | ~~2138~~ |
| X-SEC (WINN PINE CROSSING) | 1/52 | 2140 |
| HEADING (RIVERS GAUGE | 11/52 | 2148 |
| EXCESS ROW | 3/58 | 2150 |
| PROFILE (BREAK, 0+42/560) | 3/53 | 2164 |
| ROW (THRU WINN, PROP. NEW ROW LINE) | 3/58 | 2169 |
| R10 STRUCTURE (R.S. CANAL MONG) | 10/58 | 2174 |
| X-SEC (FOR (ILLEGIBLE)) | 3/56 | 2184 |
| X-SEC (JARVIS FARM) | 11/54 | 2185 |
| HOGS. ELEV. (PROP. CHANNEL CHANGES) | 12/59 | 2218 |
| X-SEC | 12/63 | 2298 |
| BOTTOM PROFILE (0+00/170+00) | 1/65 | 2300 |
| BOTTOM PROFILE (549+00/586+00) | 11/64 | 2300 |
| X-SEC | 2/64 | 2300 20 |

# RIVERSIDE CANAL

| DESCRIPTION | DATE | FIELD B |
|---|---|---|
| CROSS SECTIONS, STA 0+00 TO 115+00 | 12/86 | 2336 |
| USGS OBSERVATION WELLS ELEVATIONS | 1/84 | 2340 |

# River Side Canal Extension

| SCRIPTION | DATE | FIELD BOOK |
|---|---|---|
| Profile & X-Sec (185+61/85+00) | 3/47 | 2095 |
| Tie (From Williams SE Cor.) & Lee Moore Bridge) | 1/47 | 2100 |
| Profile (As Built, Sta 0+00/163+83) | 10/48 | 2106 |
| Marsh Ditch from Pump Site Profile | 7/49 | 2107 |
| Chk Levels | 9/50 | 2109 |
| High Water Profile (Bebow Hansen Hdwg.) | 3/50 | 2111 |
| Profile (0+20/ 22[illegible]+68) | 8/50 | 2120 - 2121 |
| ~~Cross Sec (-10+00/ +00+00)~~ | ~~8/50~~ | ~~2121~~ |
| Grade (Faben Island Bridge) | 2/53 | 2125 |
| Alignment & Profile (0+00/85+00) | 1/47 | 2138 |
| Grade (Lee Moore | 2/55 | 2170 |
| X-Sec (For Capacities) | 3/56 | 2184 |
| Condition Profile (273/321) | 10/60 | 2266 |

[redacted]

RIVERSIDE INTERC. DRAIN

| ESCRIPTION | DATE | FIELD BOOK |
|---|---|---|
| RELOCATION (COMOS TRACT) | 4/51 | 2115 |
| FLUME REPLACEMENT (GONZALES FLUME, 543+18) | 8/59 | 2178 |
| X. SEC (FLUME LOC.), 468+07 | 2/62 | 2220 |
| PROFILE (3000/4224) | 9/60 | 2235 |
| X-SEC | 6/60 | 2236 |
| PROFILE (0+00/513+43) | 6/60 | 2243 |
| X-SEC (FLUME REPL. 460+34 & 444+15) | 2/63 | 2254 |
| CONDITION PROFILE (564+41/684+33) | 3/61 | 2276 |
| X-SEC (CULVERT REPL.) 32+37 | 3/62 | 2276 |
| X-SEC (FLUME REPL. 484+86) | 5/62 | 2285 |

# RIVERSIDE LATERAL

| DESCRIPTION | DATE | FILE |
|---|---|---|
| LEVEL TIE | 11/59 | 220 |
| PROFILE (CHK IMPROVE. #100/3V186) | 11/59 | 220 |
| | | |
| | | |
| | |

## RIVERSIDE WASTEWAYS

| DESCRIPTION | DATE | FIELD |
|---|---|---|
| ELEVS (WW I & 2) | 10/81 | 1919 |
| WW I ELEVS | ~~B~~ 2/82 | 1919 |
| WW I & 2 INFO. | 3/81 | I-B |

Robbins Drain

| ESCRIPTION | DATE | FIELD BOO |
|---|---|---|
| PROFILE & X-SECT. (0+00 / 74+70) | 10/25 | 1723 |

## ROBBINS LATERAL

| SCRIPTION | DATE | FIELD BOOK |
|---|---|---|
| PROFILE & KEY MAP (4+90 / 27+78) | 7/24 | 1582 |

## ROBERTSON LATERAL

| ESCRIPTION | DATE | FIELD BOO |
|---|---|---|
| INVESTIGATION FOR LINING OF FLUME (0+00/6+44) | 6/24 | 1653 |

# RODEY CANAL (LOWER)

| DESCRIPTION | DATE | FIELD BOOK |
|---|---|---|
| TRAVERSE (0+00 / 75+85) LIMIT OF IRRIGATION | 6/30 | 1508 |
| PEREA-DURAN IRRIGATION INVESTIGATION | 8/55 | 1549 |

# RODEY LATERAL

| DESCRIPTION | DATE | FIELD BOOK |
|---|---|---|
| ELEVATIONS, DEY-1HH-98 | 5/73 | 1029 |
| ELEVATIONS, DEY-1HH-151 | 5/73 | 1029 |
| LEVELS (MATCH CANAL STA 900+88 / 1119+26) | 5/73 | 1027 |
| LEVELS (LOOP #32, RERUN) | 5/73 | 1030 |
| ELEVATIONS (DEY-1HH-97 & 152, STA 5[illegible]/132+57 & 205+68/236+23) | 6/73 | 1038 |
| CROSS SECTIONS (0+00/ 24[illegible]) | 9/75 | 1092 |
| HIGH WATER ELEV'S (0+00/ 245+41) | 8/74 | 1094 |
| X-SECT RUME PERMIT (STA 132+75) | 3/65 | 1618 |
| FINAL ELEVS | 12/72 | 1013 |

# RODRIGUEÑA LATERAL

| ESCRIPTION | | DATE | FIELD BOO |
|---|---|---|---|
| CROSS-SECTIONS | (STA 0+00/STA. 131+85) | 1/75 | 32 |
| LEVELS | (0+00/ 131+85) | 3/75 | 108 |
| STR. ELEVATIONS | (0+00 /131+85) | 3/75 | 108 |
| TRAVERSE & TIE | (STA 0+00/STA 131+85) | 3/75 | 119 |
| R.P.I. | | 9/76 | 203 |
| PROFILE | (PARSHALL FLUME, 0+00/12+87) | 3/47 | 2090 |
| PROFILE | (T.O. INVEST. FOR PARSHALL FLUMES) 0+00/12+28 | 8/47 | 2091 |
| WW LOCATION | (BARCIAS FARM) | 6/49 | 2108 |
| PROFILE | (CHK REPLACEMENT, 25+00/53+00) | 10/49 | 2108 |
| CHK GRADE | (STA 44+37) | 9/52 | 2108 |
| PROFILE | (0+00/12+12) | 6/49 | 2104 |
| WW PROFILE | (AS BUILT, 0+00 (8+64) | 12/49 | 2113 |
| X-SEC | (WW STRUCTURE, 6+72 & 8+11) | 1/50 | 2113 |
| PROFILE | (LAT. BREAK, STA 0/13) | 11/50 | 2122 |
| PROFILE | (CULVERT & FLUME (CROSSING) 54+12/65+30) | 6/51 | 2132 |
| X-SEC | (BARQUERITE WELL) | 4/54 | 2163 |
| PROFILE | (0+00/ 135+03) | 8/60 | 2257 |
| X-SEC | (BARGE REAL) | 4/61 | 2257 |
| X-SEC | (CHK REAL) | 5/61 | 2257 |
| X-SEC | (CHK REAL. 13+52) | 5/62 | 2285 |
| X-SEC | (W.W. REAL. 12+01) | 1/63 | 2295 |

RODRIGUEZ DRAIN

| DESCRIPTION | | DATE | FIELD BOOK |
|---|---|---|---|
| LOCATION | (0+00 / 54+88) | 3/34 | 1708 |
| LOCATION & PROFILE | (0+00 / 55+19) | 3/34 | 1712 |

## RODRIGUEZ LATERAL

| ESCRIPTION | | DATE | FIELD BOO |
|---|---|---|---|
| LEVEL | (273+32 West Side Canal / 45+17) | 11/73 | 1057 |
| ELEV'S | (A.P. 14+21 / 42+19) | 5/74 | 1078 |
| FINAL ELEV'S | (0+00 / 45+17) | No DATE | 1009 |

Rodriguez Sour Drain

| DESCRIPTION | DATE | FIELD BO |
|---|---|---|
| Struc. Inventory | 5/57 | 2005 |

ROSEDALE COMM UNIT # 1

| DESCRIPTION | DATE | FIELD BO |
|---|---|---|
| CONDITION PROFILE | 4/57 | 2175 |

# ROWLEY LATERAL

| DESCRIPTION | | DATE | FIELD BOOK |
|---|---|---|---|
| LEVELS | (75+67 LA UNION EAST CANAL / 46+41) | 2/74 | 1065 |
| TIE | (TO LA UNION EAST CANAL) | 2/74 | 1065 |
| ELEV'S | (A.P.; 10+69 / 64+96) | 6/74 | 1083 |
| CROSS-SECTIONS | (FOR PROPOSED SIPHON X-ING AT STA 39+21) | 5/72 | 1316 |
| X-SEC | (BRIDGE REPLACEMENT, STA 31+84) | 5/63 | 1950 |
| PROP LINE TRAVERSE | | 8/31 | 1967 |
| FINAL ELEV'S | (0+00 / 64+00) | NO DATE | 1008 |

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# SALEM ARROYO

| SCRIPTION | DATE | FIELD BOOK |
|---|---|---|
| OUTLET LOCATION & PROFILE | 12/33 | 1849 |

## Salem District

| SCRIPTION | DATE | FIELD BOOK |
|---|---|---|
| New Map Data; Maps E & F: | 3 | |
| Case-Lopez Prop. Div. Traverse | 3/36 | 1633 |
| Coke-Johnston Curve - Traverse | " | " |
| Franzay-Wilson Prop. Division | " | " |
| USRS Franzay Lat & Levee Traverse | " | " |
| Underwood Traverse | " | " |
| Carriers ACRR Sub. Traverse | " | " |
| Map E- North Side Seepage Bank | 3/36 | 1634 |
| Map F - South Side Seepage Bank | 4/36 | 1634 |
| LCS Base Line Traverse | 4/36 | 1634 |
| Meuerton - McQuid Prop Line | 5/36 | 1634 |
| Subdiv. South Salem School | 4/37 | 1634 |
| Lunsford Lane & Subdiv. Traverse | 4/37 | 1634 |
| US pts Drain Traverse | 4/37 | 1634 |
| McClintock Lat. South Subdiv. | 4/37 | 1634 |
| Maguire-Buckalew et al Subdiv. | 4/37 | 1634 |
| Map E 78/24 Subdiv. Traverse | 4/37 | 1634 |
| Salem School Traverse (USRS Sec-Line) | 4/37 | 1634 |
| Silva Lat NW Traverse | 1/36 | 1633 |
| Maguire Lane Traverse | 2/36 | 1633 |
| Martin C. Seepage Line Invest. | 2/40 | 1846 |
| Martin Sand Hill | 2/40 | 1840 |
| Section Line Computations (Salem Camp) | 1913 | 29-B |

# Salem S-1 Lateral

| DESCRIPTION | DATE | FIELD BOOK |
|---|---|---|
| ELEVATIONS, PHOTO-DEV-1HH-93 | 4/73 | 1026 |
| ELEVATIONS, PHOTO-DEV-1HH-94 | 4/73 | 1026 |
| TRAVERSE (MAP E, GARFIELD-SALEM DISTRICT) | 4/37 | 1635 |
| LEVELS | 2/23 | 6020 |
| FINAL ELEV'S | 12/72 | 1013 |

# S-2 LATERAL

| SCRIPTION | DATE | FIELD BOOK |
|---|---|---|
| ELEVATIONS, DRY-1HR-99 | 4/23 | 1026 |
| CROSS-SECTIONS (AT T.O.'S, 0+00/END) | 3/25 | 1096 |
| DISTANCES (T.O. HEADWALL TO EXIT PIPE) | 3/25 | 1096 |
| LEVELS | 2/23 | 1020 |
| FINAL ELEV'S | 12/22 | 1013 |

# SALEM LATERAL

| SCRIPTION | DATE | FIELD BOO |
|---|---|---|
| ELEVATIONS, PHOTO - DEV-1HH-93 | 4/23 | 1026 |
| ELEVATIONS, DEV-1HH-94 | 4/73 | 1026 |
| ELEVATIONS, DEV-1HH-95 | 4/73 | 1026 |
| CROSS-SECTIONS (0+00 / 26+36) | 1/74 | 1064 |
| CROSS-SECTIONS (0+00 / 167+96) | 4/75 | 1092 |
| HIGH WATER ELEV'S (0+00 / 168+03) | 8/74 | 1094 |
| TRAVERSE (FOR MAPS E & F, 0+00 / 55+61) | 2/36 | 1633 |
| NEW CK INFO. STA 139+58 | 1/67 | 17 TO |
| PROFILE FOR N-M-ST RD. | 5/52 | 1800 |
| INFORMATION - CULVERTS FOR NEW SLATE RD | 4/52 | 1806 |
| PROFILE (0+00 / 128+23) | 9/62 | 1816 |
| X-SECTION (CHECK REALIGNMENT, STA 26+26) | 1/66 | 1941 |
| PROFILE (PROPOSED SYPHON CROSSING) | 8/63 | 2089 |
| LEVELS | 1/73 | 1016 & 102 |
| FINAL ELEV'S | 12/72 | 1013 |

SALITRAL LAT.

| ESCRIPTION | | DATE | FIELD BOO |
|---|---|---|---|
| X-SEC | (THOMAS DR. PIPE, 309+25) | 3/54 | 2163 |
| X-SEC | (BROWN FARM GAS LINE) | 4/54 | 2163 |
| FARM DITCH | | 4/54 | 2163 |
| PROFILE & GRADE | (567+55 / 590+80) | 11/54 | 2166 |
| X-SEC | (ROAD SILVE WELL X-ING, 168+18) | 2/54 | 2166 |
| PROFILE | (BREAK, 509+00/527+00) | 6/58 | 2181 |
| PROFILE AT BREAK | (477+18/480+00) | 7/58 | 2181 |
| T.O.'S | (M. MORRIS, 358+13) | 1/56 | 2183 |
| X-SEC | | 9/54 | 2191 |
| NEW CHK | (72+40) | 10/54 | 2191 |
| PROFILE | (BREAK, 474+05 / 487+90) | 4/59 | 2197 |
| PROFILE | (ROAD. RR SUB, 494/482) | 6/59 | 2197 |
| CHK REPLACEMENT - X-SEC | (203+17, 248+03, 398+78, 330+21, 553+76) | 1/63 | 2210 |
| PROFILE | (BREAK, 278+80/289+60) | 4/66 | 2226 |
| CONDITION PROFILE | (0+00 / 281+00) | 3/60 | 2227 |
| CONDITION PROFILE | (282+00/577+00) | 3/60 | 2228 |
| PROFILE | (378/697) | 4/60 | 2229 |
| CHK. LEVELS | | 8/60 | 2229 |
| X-SEC | (CHK REPLAC. & LINING) | 8/60 | 2229 |
| X-SEC | (CULV. & FLUME REPLAC) 329+46 | 4/62 | 2235 |
| X-SEC | (CHK REPL. 109+88, 179+27) | 6/62 | 2259 |
| X-SEC | (CHK IMPROV., 188+56, 224+00, 233+52, 271+58) | 6/62 | 2259 |
| X-SEC | (CHK REPL., 345+90) | 7/62 | 2259 |
| X-SEC | (CULV. REPL., 122+38) | 7/61 | 2262 |
| PROFILE | (FARM DITCH INVERT., 284+89) | 7/62 | 2262 |
| ALIGNMENT & X-SEC | (CONC. LINING, 380+19 / 386+00) | 7/61 | 2270 |
| X-SEC | (GAUGE REPL. 530+04) | 10/61 | 2270 |
| X-SEC | (CHK REPL., 487+96) | 9/61 | 2271 227 |

# SALITRAL LATERAL

| DESCRIPTION | | DATE | FIELD BOOK |
|---|---|---|---|
| LEVELS | (ORIGINAL, TO STA 330+89) | 6/77 | 155 |
| CROSS-SECTIONS | (ORIGINAL, 182+50/371+62) | 7/77 | 155 |
| CROSS-SECTIONS | (ORIGINAL, 377+08/591+10) | 7/77 | 167 |
| STR. ELEVATIONS | (ORIGINAL, 186+29/551+05) | 7/77 | 168 |
| STR. ELEVATIONS | (ORIGINAL, 554+17/586+25) | 7/77 | 169 |
| TRAVERSE | (ORIGINAL, 182+50/453+61) | 6/77 | 186 |
| TRAVERSE | (ORIGINAL 453+61/591+10) | 6/77 | 187 |
| TIE | (END OF SALITRAL LAT TO 22-11) | 7/77 | 189 |
| R.P.S | | 9/77 | 204 |
| TRAVERSE | | 7/68 | 1955 |
| PROFILE | (59+91/72+62 | 3/48 | 2019 |
| PROFILE | (CULVERT, STA 332+55/349+92) | 4/49 | 2105 |
| PROFILE | (BRIDGE REPLACEMENT, 144+00/156+03) | 7/49 | 2107 |
| CONCRETE LINING DATA | | 2/50 | 2112 |
| BREAK PROFILE | (284+00/304+00) | 3/51 | 2115 |
| PROFILE | (TORNILLO FARM CHK, STA 72+00/109+00) | 3/52 | 2133 |
| PROFILE | (CHK REPLACEMENT) 144+00/180+00 | 12/51 | 2140 |
| PROFILE | (0+00/40+16) | 6/52 | 2141 |
| PROFILE | (BRIDGE REPLACEMENT, J.A. MILLER, 0+00/~~44+00~~ 348/378) | 9/52 | 2147 |
| PROFILE | (J. MILLER FARM, 378+00/398+00) | 12/52 | 2148 |
| GRADE | (381+08) | 1/53 | 2149 |
| CHK | (JAN'T. OLD GALLUP) | 10/53 | 2149 |
| CHK GRADE | (143+78/155+81) | 10/53 | 2149 |
| PROFILE | (J.A. MILLER FARM CHK) | 1/53 | 2152 |
| PROFILE | (CULVM RD SIPHON, 222+36) | 1/55 | 2157 |
| PROFILE & CHK | (144+98/173+62) | 9/53 | 2161 |

SALITRAL LAT

| SCRIPTION | | DATE | FIELD BOOK |
|---|---|---|---|
| SEEPAGE INVERT | (J.A MILLER, 381+00/386+00) | 2/61 | 2278 |
| X-SEC | (CHK LOC., 233+52) | 3/64 | 2279 |
| PROFILE | (BREAK, 530+2/507+00) | 4/63 | 2283 |
| PROFILE | (BREAK, 122+75/123+00) | 8/61 | 2290 |
| X-SEC | (BRIDGE REAL., 42+26) | 2/64 | 2294 |
| PROFILE | (BREAK, 289+95) | 2/64 | 2296 |
| PROFILE | (J MILLER FARM DITCH, 553+52) | 6/65 | 2298 |
| PROFILE | (BREAK, 247+00/304+58) | 6/66 | 2301 |
| ELEV | (DITCH BREAK, 574/585) | 12/66 | 2303 |
| X-SEC | (585+49) | 4/67 | 2307 |
| BRIDGE SEC | (VICKERS BRIDGE, 585+49) | 10/67 | 2307 |
| PROFILE | (JACKSON DITCH BREAK | 7/67 | 2310 |

# SAN ELIZARIO CANAL

| DESCRIPTION | DATE | FIELD BOOK |
|---|---|---|
| 12" OFFSET LINE. (0100 / 1STA95) | 10/23 | 1933 |
| X-SEC (FOR CALACULES) | 3/56 | 2184 |

# San Elizario Lateral

| SCRIPTION | | DATE | FIELD BOO |
|---|---|---|---|
| Levels & X-Sect. | (Original, Sta 259+51/Sta 410+84) | 6/76 | 151 |
| Sta. Elevations | (259+70/411+21) | 6/76 | 151 |
| Traverse | (Original, Sta 259+51/Sta 410+84) | 6/76 | 157 |
| R.P.'s | | 8/76 | 203 |
| Culvert Grade | (Bridge Replacement, Sta 391+72) | 8/49 | 2110 |
| Concrete Lining Data | | 2/50 | 2112 |
| Lat. Break | | 5/51 | 2125 |
| Chk Replacement | (J.K. White, 186+60/222+29) | 6/51 | 2132 |
| Chk B.M. | (186+) | 4/53 | |
| B.M. | (Hong/396+43) | 6/60 | 2159 |
| Culvery Grade | (122+29) | 2/54 | 2163 |
| X-Sec | (Janke Well) | 4/54 | 2163 |
| Profile | (186+60/176+10) | 3/53 | 2165 |
| Profile | (Carlos Guerra Ditch, 0/12+48) | 2/53 | 2165 |
| Profile | (Culvert, Sta 222+00/240+00) | 4/58 | 2181 |
| X-Sec | (For ROW) | 12/63 | 2193 |
| X. Sec | (Bridge Replacement, 52+80) | 2/62 | 2199 |
| Profile | (249+12/269+89) | 12/59 | 2211 |
| X-Sec | (Chk Replac., 113+69) | 8/62 | 2219 |
| X-Sec | (Bridge Replac., 164+27) | 2/62 | 2220 |
| Profile | (0+00/221+00) | 5/60 | 2247 |
| Profile | (222+15/396+33) | 5/60 | 2248 |
| Profile | (Break, 381+00/396+25) | 3/62 | 2268 |
| Profile | (Break, 58+00/70+00) | 7/65 | 2270 |
| X. Sec | (Bridge Repl., 324+40 } 88+30) | 12/61 | 2280 |
| X. Sec | (Chk Repl. 396+43, 396+82, Culv. Repl., Gr. Rep. 162+02) | 7/62 | 2297 |
| Profile & X-Sec | (Parra Bridge | 9/66 | 2303 |
| Overflow Invert | | 1/63/70 | 2311-2315 |

SAN ELIZARIO WW #1

| DESCRIPTION | | DATE | FIELD BK |
|---|---|---|---|
| PROFILE | | 10/54 | 2174 |
| X-SEC | (BRIDGE REPLAC., 164+27) | 2/62 | 2220 |
| PROFILE | (0100/36+68) | 8/60 | 2242 |
| X-SEC | (CNR REPL., 21+20) | 8/60 | 2242 |
| PROFILE | | 5/60 | 2248 |
| PROFILE | (FARM DITCH, 0+00/27+14 ~~29+95~~) | 10/61 | 2290 |

San Jose Ditch

| DESCRIPTION | DATE | FIE |
|---|---|---|
| Profile (0+00 / 39+00) | 9/49 | 718 |

## San Miguel District

| Description | Date | Field Bo |
|---|---|---|
| 1928 Classification Book: | | |
| R. González Lane Traverse & Subdiv. | 10/28 | 1748 |
| Martinez Subdivision, | 10/28 | 1748 |
| San Miguel Ditch Traverse | 10/28 | 1748 |

SAN MIGUEL DITCH

| ESCRIPTION | DATE | FIELD BOOK |
|---|---|---|
| HWY BRIDGE SECT. (STA 314+98 } 240+60) | 2/26 | 1930 |

# San Miguel Lateral

| ESCRIPTION | DATE | FIELD BOO |
|---|---|---|
| LEVELS (13+01 UPPER CHAMBER INV/73+73) | 12/73 | 1058 |
| LEVELS (73+73/353+01) | 12/73 | 1059 |
| ELEV'S (AERIAL PHOTO; 37+39/100+10) | 4/74 | 1074 |
| ELEV'S (A.P.; 6+26/23+85; 158+38/212+57) | 5/74 | 1078 |
| ELEV'S (A.P.; ~~267+75~~ 353+04/227+95) | 5/74 | 1080 |
| X-SECTION (FOR ROW CHECK, 6+52/10+76) | 3/65 | 1618 |
| STAFF GAUGE SETTING | 2/66 | 1621 |
| STRUC. AT BUILT (HEADING) & ELEV'S | 12/53 | 2039 |
| FINAL ELEV'S (0+00/366+70) | NO DATE | 1009 |

San Miguel Spur Drain

| SCRIPTION | DATE | FIELD BOOK |
|---|---|---|
| ROW (0+00 / 53+00) | 2/27 | 1931 |
| STRUC INVENTORY | 4/57 | 2057 |
| ROW | 9/30 | 2024 |

SAN PEDRO CANAL

| DESCRIPTION | DATE | FIELD BO |
|---|---|---|
| Loc. TRAVERSE (0+00 / 296+80) | 5/19 | 1741 |

## SANTO TOMAS AREA

| SCRIPTION | DATE | FIELD BOOK |
|---|---|---|
| RIVER TRAVERSE & BANK CONDITIONS (0425/20600) | 11/27 | 1675 |
| UPPER RIVER TRAVERSE (0400/87+85) | 9/23 | 1675 |

# STO TOMAS DRAIN

| DESCRIPTION | DATE | FIELD BK |
|---|---|---|
| STRUC. INVENTORY | 5/57 | 2005 |
| ROW (CHAINED) (0+00 / 306+50) | 10/30-1/31 | 2063 |

# SANTO TOMAS FARM DITCH

| SCRIPTION | DATE | FIELD BOOK |
|---|---|---|
| INFO. FOR MEASURING GAGE | 2/49 | 1819 |

## Santo Tomas Lateral

| ESCRIPTION | | DATE | FIELD BOO |
|---|---|---|---|
| LEVELS | (50+84 West Side Canal / 114+71) | 11/73 | 1056 |
| LEVELS | (114+71 / 246+23) | 11/73 | 1057 |
| ELEVS | (A.P. 1840 / 57+22) | 4/74 | 1077 |
| ELEVS | (A.P. 196+17 / 246+08) | 5/74 | 1078 |
| ELEVS | (A.P. 54+21 / 123+77) | 5/74 | 1080 |
| ELEVS | (A.P. 3+93 / 4+21) | 5/74 | 1082 |
| INVEST | (UNDER NM. ST. Hwy 28) | 12/33 | 1847 |
| CONDITION PROFILE | (0+00 / 180+75) | 10/08 | 1940 |
| FLUME SEC. | (OVER 24 MESA DRAIN) 246+79) | 10/33 | 1988 |
| FINAL ELEVS | (0+00 / 256+39) | NO DATE | 1009 |

[redacted]

STO TOMAS RIO DRAIN

| DESCRIPTION | DATE | FIELD BOOK |
|---|---|---|
| STRUC. INVENTORY | 5/57 | 200S |

## SANTO TOMAS RIVER LATERAL

| DESCRIPTION | | DATE | FIELD BOOK |
|---|---|---|---|
| LEVELS | (123+77 / 149+15) | 11/13 | 1057 |
| ELEV'S | (A.P. 112+75 / 148+88; 114+93 / 91+02) | 5/14 | 1078 |
| LOCATION | (0+00 / 250+26 | 10/20 | 1702 |
| LOCATION | (0+00 / 140+18) | 6/21 | 1102 |
| INVEST. | (UNDER NM ST. HWY 28,). | 12/33 | 1847 |
| FINAL ELEV'S | (0+00 / 144+15) | NO DATE | 1009 |

[redacted]

## STO TOMAS SEWER DRAIN #1

| DESCRIPTION | DATE | FIELD BC |
|---|---|---|
| PROFILE (STANDARD SEWER; 0100/1+00) | 5/58 | 1758 |
| STRUC. INVENTORY | 5/57 | 2005 |

## Santo Tomas Sewer #2

| DESCRIPTION | DATE | FIELD B |
|---|---|---|
| PROFILE (Cosito Sewer ; 6+00/84) | 5/58 | 1738 |
| ROW (C/LC) | 2/27 | 1931 |
| STRUCTURES INVENTORY | 5/57 | 2005 |
| ROW (CHANNEL, DRAIN INTERCEPTION) (4+99/21+20) | 10/30 | 2063 |

## SCHAFER LATERAL

| DESCRIPTION | DATE | FIELD BOOK |
|---|---|---|
| LEVELS (178+62 S. MIGUEL LAT / 28+50) | 12/73 | 1058 |
| ELEV'S (A.P. ; 20+26 / 34+78) | 5/74 | 1080 |
| FLUME, REPLACEMENT INFO (34+65 / 36+00) | 11/61 | 2009 |
| FINAL ELEV'S (0+00 / 34+44) | NO DATE | 1009 |

## Schaeffe Soda Drain

| Description | Date | Field |
|---|---|---|
| Location (7+50 / 22+00) | 8/26 | 1928 |
| ROW (C / L4) | 2/27 | 1931 |

# SCHOOL LATERAL

| ESCRIPTION | DATE | FIELD BOO |
|---|---|---|
| LEVELS (48+80 SCHOOL LAT / 25+95) | 8/73 | 1034 |
| LEVELS (STA 25+95 / 34+48 RICARDO LAT) | 8/73 | 1042 |
| LOCATION & PROFILE (0+00 / 69+70) | 1/24 | 1671 |
| LEVELS CCR. | 1/24 | 1671 |
| RELOCATION (10+20, 28+00, 41+56) | 1/24 | 1671 |
| W.W. PROFILE (48+00 / 50+65) | 1/24 | 1671 |
| N.M ST RD CROSSING - INVESTIGATION PROFILE | 2/54 | 1689 |
| PROFILE (FOR NM ST RD) | 9/53 | 1825 |
| FINAL ELEVS (0+00 / 127+00) | NO DATE | 1007 |

School Section Sour Prairie

| SCRIPTION | DATE | FIELD BOO |
|---|---|---|
| ROW (0/25) | 5/27 | 1931 |
| ROW (CHAINED) | 10/30 | 2004 |
| | | |

# SCHULTZ LATERAL

| SCRIPTION | | DATE | FIELD BOOK |
|---|---|---|---|
| LEVELS | (STA 0+20/STA 97+10) | 3/74 | 49 |
| STR. ELEVATIONS | (0+20 / 97+10) | 3/74 | 49 |
| CROSS-SECTIONS | (0+20 / 97+10) | 3/74 | 49 |
| TRAVERSE | (0+20 / 97+10) | 3/74 | 80 |
| TIE | (FROM SCHULTZ TO 18C) | 3/74 | 80 |
| CONSTRUCTION LEVELS | | 12/74 | 101 |
| TRAVERSE | (AS BUILT, 0+37/87+47) | 3/76 | 135 |
| PROFILE & X-SECTIONS | (AS BUILT, 1+00/84+00) | 3/76 | 135 |
| STR. ELEVATIONS | (AS BUILT, 0+37/87+38) | 3/76 | 135 |
| REFERENCE PTS. TO BOUNDARY MARKERS | | 3/77 | 172 |
| TRAVERSE | | 8/31 | 2081 |

(UPPER) SCHULTZ LATERAL

| ESCRIPTION | DATE | FIELD BOO |
|---|---|---|
| TRAVERSE | 3/77 | 191 |

SEGULIA SPUR BASIN

| DESCRIPTION | DATE | FIELD BOOK |
|---|---|---|
| CONDITION PROFILE (0400/2650) | 9/60 | 2262 |

SELDEN AREA

| SCRIPTION | DATE | FIELD BOO |
|---|---|---|
| SEEPAGE INVESTIGATION, 1926 CLASSIFICATION | 5/26 | 155 |

# SELDEN DRAIN

| DESCRIPTION | DATE | FIELD BK |
|---|---|---|
| CROSS-SECTIONS (AT ℄ ARRINGTON LAT, STA 14+44, COUNTY RD, HARE LAT, STA 96+13, KERR LAT) | 3/75 | 1609 |
| INFO. FOR ABANDONMENT | 1/74 | 1516 |
| "A" LINE ℄ RELOCATION | 4/20 | 1534 |
| R.O.W. | 5/59 | 1534 |
| CROSS-SECTIONS (0+00 / 2+00) | 5/59 | 1534 |
| ~~SELDEN AREA SEEPAGE INVESTIGATION~~ | 5/26 | ~~1551~~ |
| CUNNINGHAM CULVERT | 10/49 | 1868 |
| CROSS SECTION (FLUME REPLACEMENT @ 163+06) | 8/65 | 1959 |
| RELOCATION | 9/50 | |
| RHODES ARROYO CULVERT | 12/46 | 2048 |
| KERR CULVERT STA 117+00 | | |
| ROW TRAVERSE | 2/31 | 2076 |

# SELDEN LATERAL

| DESCRIPTION | | DATE | FIELD BOOK |
|---|---|---|---|
| LEVELS | (STA 128+00 LEASBURG CANAL / 182+06, R-246 OSCOGS) | 8/73 | 1038 |
| ELEVATIONS | (AERIAL PHOTO #120, 6476/1955) | 10/73 | 1050 |
| PROFILE | (FOR CONCRETE LINING, OHIO/1943) | 2/37 | 1518 |
| FINAL ELEV'S | | NO DATE | 1006 |

# SHALEM DRAIN

| DESCRIPTION | DATE | FIELD BOOK |
|---|---|---|
| FLUME SECT. (STA 111+30) | 6/26 | 1930 |
| ROW CHAINED (0+00/127+50) | 2/31 | 1965 |

SALEM SOUR DRAIN

| SCRIPTION | DATE | FIELD BOOK |
|---|---|---|
| ROW CHAINED. (0+00 / 34+97) | 2/3L | 1965 |

# SHEAFFER TOUR DRAIN

| DESCRIPTION | DATE | FIELD BO |
|---|---|---|
| ROW (CHAINED) | 9/30 | 2024 |
| STRUC INVENTORY | 5/57 | 2057 |

# SILVA LATERAL

| SCRIPTION | DATE | FIELD BOO |
|---|---|---|
| LEVELS, (LOOP #31, STA 0+00/STA 24+56) | 5/73 | 1027 |
| ELEVATIONS, DEY-1/4+95 | 5/73 | 1029 |
| PROFILES & WW PROFILE (FOR ARROYO OUTLET INFO.) | 12/59 | 1792 |
| WW SOIL LOC TEST WELLS & PROFILE | 1/60 ~~12/59~~ | 1980 |
| FINAL ELEVS | 12/72 | 1015 |

Snow Drain

| DESCRIPTION | DATE | FIELD BOOK |
|---|---|---|
| ROW TRAVERSE. (0+00 / 5+41) | 2/3/ | 1993 |

Snow Lateral

| SCRIPTION | DATE | FIELD BOOK |
|---|---|---|
| LOCATION (0+00 / 33+66) | 7/23 | 1541 |

Snow Levee

| DESCRIPTION | | DATE | FIELD BOOK |
|---|---|---|---|
| Relocation | (0+00 / 15+70) | 8/26 | 1649 |
| Profile | (0+00 / 16+72) | 8/26 | 1649 |

SOCORRO INTERC. DRAIN

| DESCRIPTION | DATE | FIELD BOO |
|---|---|---|
| CONDITION PROFILE (0+00 / END) | 6/60 | 2239 |
| X-SEC (FLUME REPL., 0+42) | 3/63 | 2239 |
| X-SEC (FLUME REPL., 13+25 | 4/62 | 2239 |

# Socorro Lateral

| Description | | Date | Field Book |
|---|---|---|---|
| Levels | (Original, Sta 6+46/Sta 165+81) | 5/76 | 138 |
| Cross-Sections | (Original, 0+20/173+21) | 5/76 | 138 |
| Str. Elevations | (Original, 0+00/173+28) | 5/76 | 140 |
| Traverse | (Original, 0+20/148+25) | 4/76 | 147 |
| Traverse | (Original, 148+25/173+21) | 4/76 | 148 |
| Traverse | (As built, From AP 22 To AP 31) | 2/77 | 163 |
| Traverse | (As built, Sta 0+33/AP 21) | 2/77 | 163 |
| R.P.'s | | 8/76 | 203 |
| Seepage Wells | Invest. (126+00/130+00) | 9/49 | 2106 |
| X-Sec | (Sta 0+30) | 6/49 | 2109 |
| Profile | (145+00/157+00) | 6/52 | 2133 |
| Gas Line Bend | (Sta 99+62) | 4/54 | 2163 |
| X-Sec | (A. Vasquez Farm) 68+64) | 4/55 | 2178 |
| Row & X-Sec | (121+19/135+81) | 12/60 | 2196 |
| Condition Profile | (0+00/176+41) | 6/60 | 2241 |
| X-Sec | (Chk Repl. | 4/61 | 2241 |
| Culvert Grade ~~X-Sec~~ | (Culvert Xing FM 258), 99+55 | 1/61 | 2241 |
| Profile | (Cover run of Lat., 108+28/121+24) | 8/62 | 2241 |
| Row & X-Sec | (121+19/133+34) | 1/61 | 2257 |
| Profile | (Overflow, Mrs. Duron's Home, 38+46/52+32) | 8/63 | 2289 |
| X-Sec | (Chk Repl., 136+74 & 168+57) | 1/63 | 2295 |
| X-Sec | (Chk Repl., 52+65 - 108+28) | 1/63 | 2298 |
| X-Sec | | 9/64 | 2298 |
| Profile | (Ditch Break) | 9/66 | 2304 |

# South Side Feeder

| Description | Date | Field |
|---|---|---|
| Profile | 3/76 | 1912 |
| Profile (Bridge Replacement, 118+64/150+61) | 10/49 | 2104 |
| Culvert Grade, (Sta 128+43) | 10/50 | 2104 |
| Profile (130+00/141+00) | 12/52 | 2148 |
| X-Sec (Water Line X-ing, FM 258) | 9/56 | 2183 |
| Profile & X-Secs (101+30/108+26) | 9/54 | 2185 |
| Profile (72+00/152+00) | 12/59 | 2211 |
| Profile (Bridge, 25+01/50+00) | 3/60 | 2248 |
| Cond. Profile (0+00/150+35) | 6/61 | 2287 |
| X-Sec (CMK Recl., 7/+76) | 7/62 | 2297 |
| X-Sec (CMK Recl. 79+36) | 1/63 | 2298 |
| X-Sec (Longemore Bridge.) | 10/67 | 2307 |
| X-Sec (Foot Bridge.) | 10/67 | 2307 |
| X-Sec | 9/69 | 2312 |
| BM Transfer (25+01) | 2/70 | 2312 |
| Profile (With Recl.) | 3/70 | 2315 |

# South Side Lateral

| DESCRIPTION | DATE | FIELD BOOK |
|---|---|---|
| Location | 6/18 | 1928 |

STAHMAN JOHN ROAD

| DESCRIPTION | DATE | FIELD BOOK |
|---|---|---|
| ROW (0/7) | 2/27 | 1991 |
| STRUCTURES INVENTORY | 5/57 | 2005 |
| ROW, (CHAINED) (0100/1401.74) | 10/30 - 1/31 | 2063 |

STAPLES LATERAL

| DESCRIPTION | DATE | FIELD BOOK |
|---|---|---|
| LOCATION (0+00/60+50) | 6/23 | 1755 |

# STEVENS DRAIN

| DESCRIPTION | DATE | FIELD BOO |
|---|---|---|
| PROFILE - DRAIN INVESTIGATION ALONG BORDELAND ROAD | 10/30 | 1920 |

# STEVENS LATERAL

| DESCRIPTION | | DATE | FIELD BOOK |
|---|---|---|---|
| LEVELS | (STA 5+01 / STA 82+71) | 2/74 | 48 |
| STR. ELEVATIONS | (5+01 / 82+76) | 2-3/74 | 48 |
| CROSS SECTIONS | (STA 0+15 / STA 82+71) | 3/74 | 48 |
| TRAVERSE | (STA 0+15 / STA 82+71) | 2/74 | 76 |
| TIE | (TO BASELINE) | 2/74 | 76 |
| R P'S | | NO DATE | 101 |
| TRAVERSE | (AS BUILT, 0+15 / 158+63) | 2/76 | 131 |
| CROSS-SECTIONS | (AS BUILT, 1+00 / 82+30) | 2/76 | 131 |
| STR. ELEVATIONS | (AS BUILT, 0+45 / 78+03) | 2/76 | 131 |
| PRELIMINARY PROFILE | INVEST. (AT DRAIN CROSSING, 0+00 / 17+00) | 10/30 | [redacted] |
| W.W. ENGINEER | INVESTIGATION | 2/49 | 1865 |
| CONSTRUCTION LEVELS | | 8/75 | 1910 |
| R-P'S | | 8/75 | 1920 |

STRANGE LATERAL

| DESCRIPTION | DATE | FIELD BK |
|---|---|---|
| STRANGE TRACT #1 INVESTIGATION - PROFILE, 0400/1450 | 4/26 | 1554 |

[redacted]

Strong Sour Drain

| DESCRIPTION | DATE | FIELD BOOK |
|---|---|---|
| Row Traverse (0+00 / 32+00) | 1/31 | 1993 |

# STROUT LATERAL

| DESCRIPTION | DATE | FIELD BO |
|---|---|---|
| LEVELS & TIE (329+79 SAMUEL LAT/12+84) | 12/73 | 1059 |
| ELEV'S (A.P.; 8+20/8+53) | 5/74 | 1080 |
| PROFILE FOR FLUME ACROSS GLENN SNR DRAIN | 2/42 | 1864 |
| IRRIGATION INVEST. | 10/42 | 1864 |
| FLUME CROSSING DETAIL | 11/42 | 1864 |
| LOCATION | 1/43 | 1864 |
| FINAL ELEV'S (0+00/25+90) | NO DATE | 1009 |

# SYKES LATERAL

| DESCRIPTION | DATE | FIELD BOO |
|---|---|---|
| ELEVATIONS PHOTO-052-1MH-6 | 3/73 | 1024 |
| PROFILE (0+00/5+68) | 6/28 | 1722 |
| CHANGE LOCATION | 8/49 | 1865 |
| NEW HOUSE LOCATION | 4/52 | 2075 |
| NEW LOCATION | 5/52 | 2075 |
| FINAL ELEVS | 12/72 | 1015 |
| LEVELS | 1/73 | 1012 |

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260 TURNER SOUR DRAIN
261 TURNEY LATERAL

# T-131 LATERAL

| SCRIPTION | | DATE | FIELD BOOK |
|---|---|---|---|
| LEVELS & X-SEC | (0+66 / 140+39 | 9/73 | 46 |
| STRUC. ELEV. | (RB #4 / 140+43) | 9/73 | 46 |
| INVEST. & PROFILE | (0+15 / 12+22) | 3/47 | 2090 |
| CHK GRADE | | 3/54 | 2166 |
| X-SEC | (HOOVER FARM STATION, 11+15) | 1/55 | 2170 |
| PROFILE | (CHK REPLACEMENT, 51/26) | 1/59 | 2176 |
| TRAVERSE | | 12/51 | 2189 |
| PROFILE | (131+18 / 83+68) | 9/58 | 2191 |
| PROFILE | (83+68 / 122+60) | 10/54 | 2191 |
| CHK GRADE | (83+68) | 11/54 | 2191 |
| X-SEC | (CULV. REPLAC. 55+40 / 105+04) | 9/62 | 2219 |
| PROFILE | (0+00 / 26+60) | 8/60 | 2242 |
| PROFILE | | 7/63 | 2279 |
| CONT. PROFILE | (0+00 / 151+23) | 4/61 | 2285 |
| X-SEC | (CHK REPL, 96+69) | 5/61 | 2285 |
| PROFILE | FROM 131+ INVEST, 51+79) | 3/63 | 2295 |
| TRAVERSE | (0+27 / 149+34) | 8/73 | 74 |
| TIE | (FROM T-541 & TO TORNILLO TRAV.) | 10/73 | 74 |
| PROFILE | | 10/54 | 2174 |

T-131 WW

| SCRIPTION | DATE | FIELD BOOK |
|---|---|---|
| CONDITION PROFILE | 1/51 | 2122 |

# T-216 LATERAL

| DESCRIPTION | DATE | FIELD BO |
|---|---|---|
| X-SECTIONS (34+62 / 44+98, BREAK INTO OWEN SPUR DR.) | 10/46 | 1909 |
| PROFILE (SEEP. INVERT (132+00 / 151+26) | 10/49 | 2107 |
| BRIDGE CHK (TORNILLO CANAL, MA 214+51) | 8/49 | 2109 |
| PROFILE (CULVERT, 114+00 / 148+00) | 3/50 | 2115 |
| PROFILE | 2/52 | 2125 |
| FENCING PERMIT (ALLISON FARM) | 6/54 | 2138 |
| PROFILE (SEQUILA FLUME INVERT.) | 2/52 | 2140 |
| PROFILE (PROD HENDERSON SIPHON) | 11/54 | 2157 |
| BENCH MARKS (HDNG / 203+07) | 6/60 | 2159 |
| GRADE STAKES (HENDERSON SIPHON) | 1/55 | 2176 |
| PROD. SIPHON (HENDERSON) | 3/55 | 2178 |
| PROFILE (J SEQUILA SIPHON, 84+96) | 1/56 | 2183 |
| PROFILE (M.N. LETTUNICH FARM SIPHON) | 2/56 | 2183 |
| PROFILE (SHARP FARM DITCH INVERT, 60+95) | 7/62 | 2219 |
| LINING INVERT (141+59 / 0+00) | 11/61 | 2220 |
| X-SEC (CHK REPL., 66+38) | 4/61 | 2238 |
| PROFILE (OFFR / 283+37) | 5/60 | 2249 |
| X-SEC (BRIDGE REPL., 93+25 | 10/61 | 2270 |
| CHK-LEVELS (93+25) | 10/61 | 2270 |
| X-SEC (CONC. LINING, IVEY FARM) | 9/61 | 2283 |
| X-SEC (BRIDGE REPL., 108+28) | 5/61 | 2286 |
| ALIGNMENT & X-SEC (CONC. LINING) | 10/61 | 2292 |
| GRADE | 12/61 | 2292 |
| X-SEC (CHK REPL. 194+54 & 204+00) | 1/63 | 2295 |
| ~~X-S~~ PROFILE (WELL PIPE INLET, ALLISON FARMS) | 3/64 | 2296 |
| | | |
| | | |
| | | 277 |

# T-462 LATERAL

| DESCRIPTION | | DATE | FIELD BOOK |
|---|---|---|---|
| TIE | (T-462 LAT TO TORNILLO TRAVERSE) | 2/73 | 35 |
| TRAVERSE | (STA 0+25 / STA 16+29) | 2/73 | 35 |
| TIE | (T-462 TRAVERSE TO TORNILLO TRAVERSE) | 2/73 | 35 |
| LEVELS | (STA 423+73 / STA 463+27) | 3/73 | 35 |
| STR. ELEVATIONS | (STA 0+21 / STA 6+37) | 2/73 | 35 |
| DISTANCES | (ON NEW ALIGNMENT T462) | 4/73 | 35 |

# T-520 LATERAL

| SCRIPTION | | DATE | FIELD BOOK |
|---|---|---|---|
| INVESTIGATION | (ELEV'S) 0+00/4+30 | 2/47 | 2090 |
| PROFILE | (0+45/14+96) | 3/53 | 2164 |
| GRADE | | 12/54 | 2169 |
| X-SEC | (O.A. CRIBER'S) PROP. WELL PIPE X-ING) | 1/55 | 2177 |
| X-SEC | (WELL PIPE X-ING | 3/52 | 2183 |
| X-SEC PROFILE AT BARRN | | 3/56 | 2163 |
| PROFILE | (8+23/48+08) | 2/60 | 2202 |
| PROFILE | (0+00/38+47) | 7/61 | 2250 |
| CONN. PROFILE | (0+00 778+02) | 2/63 | 2288 |
| X-SEC | (CHK REAL. 4+30) | 1/63 | 2295 |
| PROFILE | (BARRL) | 6/69 | 2316 |

# TALBOT LATERAL

| DESCRIPTION | | DATE | FIELD BOOK |
|---|---|---|---|
| LEVELS | (12444 CL UNION NOR LAT/ 21448) | 3/74 | 1067 |
| LEVELS | (27455/ 152+20/ | 3/74 | 1068 |
| ELEV'S | (A.P.; 21435/ 21448) | 6/74 | 1084 |
| ELEV'S | (A.P.; 21448/ 152+20) | 6/74 | 1085 |
| X-SECTIONS | (AT STA 17+25, FOR PUMP PERMIT) | 4/72 | 1516 |
| TRAVERSE | (NEW MAP, ALTA VISTA DISTRICT) | 7/54 | 1986 |
| FINAL ELEV'S | (0+00 / 152+00) | NO DATE | 1008 |

# TAYLOR LATERAL

| DESCRIPTION | DATE | FIELD BO |
|---|---|---|
| LEVELS (LEESBURG CANAL STA 588+94/STA 125+52) | 8/73 | 1037 |
| LEVELS (588+94 LEESBURG / 70+41) | 10/73 | 1040 |
| ELEVATIONS (AERIAL PHOTO # 11; 74+84/125+52) | 10/73 | 1051 |
| CONDITION PROFILE (41+04 / 70+08) | 10/75 | 1952 |
| X-SEC (LINE CHANGE, SB+44/79+76) | 10/68 | 1959 |
| FINAL ELEVS | NO DATE | 1006 |

# Texas Lateral

| DESCRIPTION | DATE | FIELD BO |
|---|---|---|
| Traverse (New Mad Dete, Mesilla Valley); 0100/S7t28 | 8/31 | 2084 |
| Profile | 3/40 | 1985 |

THOMPSON SOUR DRAIN

| SCRIPTION | DATE | FIELD BOOK |
|---|---|---|
| COND. PROFILE (0+00 / 9+69) | 5/61 | 2286 |

THREE SAINTS CAVE W W

| DESCRIPTION | DATE | FIELD BO |
|---|---|---|
| TRAVERSE (NEW MAP DATA, MESILLA VALLEY) | 8/31 | 2084 |

# Three Saints East Canal

| SCRIPTION | DATE | FIELD BOOK |
|---|---|---|
| Waterway Relocation | 2/51 | 1601 |
| Profile for El Paso County Hwy Culvert | 5/54 | 1745 |
| Profile for Sabien O'Flow | 9/57 | 1745 |
| BM Levels (Anthony Country Club Rd.) | 7/58 | 1745 |
| Profile for 84" CIP Culvert, Sta 14+41 | 9/54 | 1758 |
| Profile for St. Hwy, Sta 243+00) | 5/52 | 1803 |
| W.W. Investigation (into Anthony Drain) | 10/39 | 1841 |
| New Check | 1/54 | 1859 |
| Ditch Break (On S. Mokales) | 6/47 | 1868 |

# THREE SAINTS EAST LATERAL

| DESCRIPTION | DATE | FIELD BOOK |
|---|---|---|
| LEVELS (0+00 / 214+63) | 8/73 | 1048 |
| LEVELS | | |
| ELEV'S (A.P.; 6+75 / 49+21) | 6/74 | 1081 |
| ELEV'S (A.P.; 44+83 / 254+21) | 6/74 | 1083 |
| HIGH WATER ELEV'S (0+00 / 274+32) | 7/74 | 1088 |
| CROSS-SECTIONS (1+50 / 242+00) | 7/75 | 1107 |
| X-SECTIONS (214+63 / 268+28) | 1/79 | 1112 |
| BRIDGE LEVELS (215+63 / 235+33) | 1/79 | 1115 |
| X-SECTION (FOR FLUME PERMIT, STA 61+77) | 3/65 | 1688 |
| STAFF GAUGE SETTING | 2/67 | 1621 |
| LEVELS | 2/52 | 1790 |
| STR-ELEV (STA 116+05, 214+65, 152+90, 104+98) | 5/52 | 1990 |
| FINAL ELEV'S (0+00 / 286+00) | NO DATE | 1008 |

## THREE SAINTS LATERAL

| :SCRIPTION | DATE | FIELD BOOK |
|---|---|---|
| LEVELS (735+98 / 887+84) | 9/75 | 1048 |
| ELEV'S (A.P.; 741+09 / 792+17) | 5/74 | 1077 |
| ELEV'S (A.P.; 803+53 / 857+08) | 5/74 | 1081 |
| ELEV'S (A.P.; 853+34 / 885+97) | 5/74 | 1082 |
| HIGH WATER ELEV'S (741+09 / 887+84) | 7/74 | 1088 |
| X-SECTION (FOR SYPHON REMIX, STA 746+54) | 3/65 | 1618 |
| STAFF GAUGE SETTING (STA 747+09) | 2/[illegible] | 1621 |
| ELEV'S. (243+32 / 252+71) | 12/83 | 1891 |
| ELEV. (LEFT & RIGHT BANK) | 2/84 | 1891 |
| SALDEEK INVESTIGATION TRAVERSE | 10/69 | 1944 |
| DITCH BREAK INFO | 8/60 | 2056 |
| FINAL ELEV'S (735+98 / 887+14) | NO DATE | 1008 |

# Three Saints Main Canal

| SCRIPTION | DATE | FIELD BOOK |
|---|---|---|
| Levels (541+24 / 735+98) | 9/73 | 1047 |
| Elev's (A.P., 541+24 / 746+35) | 5/74 | 1079 |
| High Water Elev's (558+77 / 738+30) | 7/74 | 1086 |
| Cross-Sections (541+24 / 746+29) | 6/75 | 1103 |
| X-Sections (For Pump Permit at Sta 625+15 & 613+95) | 4/72 | 1516 |
| Bover Ditch Investigation | 3/65 | 1618 |
| X-Sect Pump Permit (Sta 594+79) | 3/65 | 1618 |
| X-Sect For Siphon (755+33) | 1/66 | 1627 |
| Traverse (0+00 / 70+37) | 10/31 | 1691 |
| Location (0+00 / 116+80) | 7/22 | 1740 |
| Encroachment on ROW (1+02 / 118+) | 12/22 | 1740 |
| Profile (857+15 / 887+00) | 11/52 | 1741 |
| Profile For Extension 84" CMP Culvert, Sta 627+70 | 2/60 | 1741 |
| Traverse Location (New Map Data, Mesquite District) | 3/29 | 1746 |
| Levels (From Del Rio Drain) | 1/37 | 1749 |
| Profile (0+00 / 347+80) | 1/37 | 1749 |
| Tede Bridge (Sta 818+80) | 7/62 | 1850 |
| Greenwood ROW Info | 10/62 | 1850 |
| Levels | 12/78 | 1896 |
| Gallogher-Hudson Bridge Sect. (Sta 16+86) | 12/25 | 1930 |
| Inventory Bridge (Sta 2+24) | 12/25 | 1930 |
| Amis Bridge Sect. (Sta 200+19) | 1/26 | 1930 |
| Final Elev's (541+24 / 735+57) | No Date | 1010 |

# Three Saints West Canal

| Description | Date | Field Bo |
|---|---|---|
| W.W #20 Profile (For D. Dna County Hwy Culvert) | 10/52 | 1741 |
| Traverse Coff Old Anthony Rio Rd. Traverse | 12/31 | 1855 |
| Profile (New, Checks) | 10/50 | 2031 |

# Three Saints West Lateral

| Description | | Date | Field Book |
|---|---|---|---|
| Levels | (88+84 Three Saints Lat / 45+45) | 1/74 | 1060 |
| Levels | (45+45 / 174+31) | 2/74 | 1063 |
| Elev's | (A.P.; 30+07 / 45+45) | 6/74 | 1081 |
| Elev's | (A.P.; 0+00 / 30+07) | 5/74 | 1082 |
| Elev's | (A.P.; 45+45 / 174+39) | 6/74 | 1083 |
| High Water Elev's. | (85+13 / 174+31) | 7/74 | 1088 |
| H.W. Elev's | (0+00 / 69+15) | 7/74 | 1090 |
| Cross Sections | (0+00 / 174+31) | 7/75 | 1104 |
| X-Section | (For Check Replacement, Sta 59+74) | 3/65 | 1618 |
| Staff Gauge Settings | | 2/66 | 1621 |
| X-Sect. Siphon Permit | (Arovenue, Sta 82+02) | 1/64 | 1625 |
| Str. Check | (Sta. 105+31, 95+99; 85+13) | 5/52 | 1990 |
| Final Elev's | (0+00 / 174+00) | No Date | 2008 |

TIERRA BLANCA [redacted] LEVEE

| SCRIPTION | DATE | FIELD BOOK |
|---|---|---|
| LEVEE PROFILE | 4/24 | 1693 |

TONOPAH DISTRICT

~~HAWTHORNE~~ ~~VALLEY~~

| DESCRIPTION | DATE | FIELD BOOK |
|---|---|---|
| ~~TEST WELLS~~ LOCATION & ELEVATION | ~~11/56~~ | ~~715~~ |
| NEW MAP & DATA: | | |
| WEST & EAST TOE OF MESA TRAVERSE | 3/35 | 1718 |
| BRAWLEY TRAVERSE | 9/41 | 1844 |

Toivuco Dyke

| DESCRIPTION | DATE | FIELD BOO |
|---|---|---|
| Location C0100 / B3100 1 | 9/27 | 2014 |

TONUCO RIVER

| SCRIPTION | DATE | FIELD BOOK |
|---|---|---|
| X- SECTION (0+00 / 10+95) | 1/26 | 1640-1641 |

# Tonuco Spur Drain

| DESCRIPTION | | DATE | FIELD BO |
|---|---|---|---|
| PROFILE | CONTOUR LINES | 12/58 | 1750 |
| ROW TRAVERSE | CORNER (CONT'D) | 3/31 | 1879 |

TORNILLO CANAL

| DESCRIPTION | | DATE | FIELD BK |
|---|---|---|---|
| GRADE | (HENDERSON SIPHON, 351+50 & 661+55 SCHULTZ FLUME) | 1/55 | 2176 |
| PROPOSED SIPHON | (COOK SIPHON, 257+30) | 3/55 | 2176 |
| LAND, INVEST. | (COOK FARM) | 1/59 | 2176 |
| ROW LOC | | 9/56 | 2182 |
| X-SEC | (38+85) | 2/56 | 2183 |
| X-SEC | (FOR CULVERTS) | 3/56 | 2184 |
| WATER SURFACE ELEV. | (DAILY LAND TO RUARUS), 0400/13+41 | 7/89 | 2186 |
| X-SEC | (BALDER RECHEC., 395+55) | 11/60 | 2224 |
| X-SEC | (SEEPAGE INVEST., 525+00/533+00) | 1/63 | 2254 |
| PROFILE | (551+52/595+00) | 9/60 | 2259 |
| CONDITION PROFILE | (~~273/321~~ 0400/1001+04) | 10/60 | 2266 |

# Tornillo Canal

| DESCRIPTION | DATE | FIELD BOOK |
|---|---|---|
| Traverse (No. "T") (Along Lower End of Tornillo Canal To IBC#19) | 9/72 | 53 & 54 |
| Traverse (From Point "S" To IBC#21) | 11/72 | 54 |
| Cross-Sections | 1/78 | 176 |
| Profile & X-Sect. (355+00/376+00) | 11/47 | 2019 |
| Turnout - Meter Gate Investigation | 1/49 | 2105 |
| Profile (Bridge Replacement (250+10/244+00) | 8/49 | 2109 |
| Profile (Bridge Replacement (0+00/10+00) | 8/49 | 2110 |
| Seep. Wells (Deflection Meter | 1/50 | 2110 |
| Natural Surfaces (Elev's for WW#2, 552+00/551+00) | 12/49 | 2113 |
| Elevation (Top of Gate) Heading | 11/50 | 2123 |
| Profile & X-Sec (S.G. Schairer Farm Flume) 230+20/238+00 | 2/54 | 2127 |
| X-Sec (505+60) | 6/52 | 2133 |
| Relocation (1+00/52+00) | No Date | 2134 |
| Profile & Frank Owen Bridge, (Sta 462+17) | 8/47 | 2138 |
| Profile (R.J. Hoover Prop. Siphon, Sta 149+13) | 6/54 | 2153 |
| Profile (Prop. Henderson Siphon) | 3/55 | 2157 |
| X-Sec (S.G. Schario, 230+20) | 3/54 | 2163 |
| X-Sec (Ramstead Flume, 109+34) | 4/54 | 2165 |
| Profile (339/387) | 5/53 | 2164 |
| Bridge Grade (Tornillo Farms) | 7/53 | 2164 |
| Grade | 2/54 | 2166 |
| Seepage Investigations | 3-4/54 | 2168 |
| ROW | 2/56 | 2169 |
| X-Sec (Allison & Owen) | 1/55 | 2170 |
| X-Sec (Fields Siphon, 269+82) | 2/55 | 2170 |
| Siphon [redacted] (Tornillo Farm Co) Ivey Farm Bridge & Hoover Br. | 5/54 | 2172 |
| Profile (250+10/270+04, FM1109 X-ing) | 8/54 | 2172 |

TORNILLO CANAL

| DESCRIPTION | | DATE | FIELD BK |
|---|---|---|---|
| X-SEC | (4442) BRIDGE) | 8/55 | 2181 |
| X-SEC | (PIPE X-INS, L.R. ALLISON, 418+03) | 1/65 | 2279 |
| PROFILE | (ALLISON FARM PITCH 1AA INLET, 390+20) | 6/61 | 2289 |
| PROFILE | (382+15/374+41) | 6/61 | 2289 |
| X-SEC | | 6/66 | 2304 |
| X-SEC | | 2/64 | 2312 |

## Tornilled Canal Wastewy

| ESCRIPTION | DATE | FIELD BOO |
|---|---|---|
| Levels | 12/77 | 176 |

# Tornillo Drain

| SCRIPTION | DATE | FIELD BOOK |
|---|---|---|
| X-Section & Profile | 5/76 | 1955 |
| X-Sec (Burris Farm) | 12/49 | 2113 |
| X-Sec (Flume on City Land, STA 34+94) | 3/52 | 2133 |
| Profile (Lehunich & Young New Flume) | 1/52 | 2140 |
| Profile (0+00 / 178+34, IBC Notes) | 6/46 | 2144 |
| Profile (To Hudspeth Canal, IBC Notes) | 4/46 | 2146 |
| Culvert Grade (Tornillo Farm Co.) | 6/54 | 2153 |
| X-Sec (Henderson Flume) | 12/54 | 2157 |
| Flume Grade (Henderson Flume | 1/55 | 2175 |
| Flume Invest. (Henderson Flume) | 2/55 | 2177 |
| Grade - Culvert & F. Burris Flume | 3/55 | 2178 |
| Culvert Grade (At T-520 Lat) | 11/54 | 2185 |
| X-Sec (New Flume, 432+34) | 10/63 | 2193 |
| X-Sec (Bridge Realignment, 11+36 & 70+41) | 11/60 | 2224 |
| Profile (3+40 / 441+30) | 4/60 | 2231 |
| X-Sec (Culvert Repl.) | 5/60 | 2232 |
| X-Sec (Culvert Repl) | 1/61 | 2235 |
| X-Sec (Bridge Repl., 322+50) | 7/63 | 2249 |
| Cond. Profile (0+00 / 79+78) | 9/60 | 2262 |
| X-Sec (Rr Xing, 0+33, 356+25 | 2/63 | 2290 |
| X-Sec (Prop. Allison Farm Flume) | 3/64 | 2296 |
| X-Sec (37+88) | 6/67 | 2308 |
| Culv. & Flume Sec (L. Burris Farm) | 6/67 | 2308 |

# TORNILLO INTERC. DRAIN #1

| DESCRIPTION | | DATE | FIELD BO |
|---|---|---|---|
| PROFILE | (159/169) | 5/53 | 2164 |
| CULVERT SEC | (TORNILLO FARMS) 374+44 | 6/53 | 2169 |
| PROFILE | | 10/54 | 2184 |
| X-SEC | (FLUME REPLACEMENT, 188+55) | 8/59 | 2178 |
| X-SEC | (CULVERT REPLAC., 28+33) | 4/62 | 2218 |
| X-SEC | (CULV. REPL., 129+71) | 4/62 | 2239 |
| PROFILE | (0+00/215+20) | 9/60 | 2255 |

TORNILLO INTERC. DRAIN #2

| DESCRIPTION | DATE | FIELD BOO |
|---|---|---|
| CULVERT GRADE | 9/55 | 2174 |
| PROFILE (0+00 / 14+50.00) | 9/60 | 2255 |
| COND. PROFILE (0+00 / 12+00) | 9/60 | 2262 |
| X-SEC (FLUME REEL 12SH12) | 3/62 | 2276 |

# TORNILLO SOUR DRAIN

~~LOAN DE HERRERA MAIN CANAL~~

| DESCRIPTION | DATE | FIEL |
|---|---|---|
| ~~PROFILE (0100/20+00)~~ | ~~3/60~~ | ~~22~~ |
| X-SEC (CULV. REPL., 31+14 & 40+09) | 4/62 | 22 |
| X-SEC (REPL. CULVERT, 47+71) | 4/62 | 22 |
| CONDITION PROFILE (0+00/70+86) | 9/60 | 22 |
| X-SEC (CULV. REPL., 0+40) | 3/63 | 22 |

TORNILLO WW #1

| DESCRIPTION | DATE | FIELD BOOK |
|---|---|---|
| STRUC. ELEV'S | 10/58 | 2181 |
| INFO. | 3/81 | 1-B |

304

## TORNILLO BASE STATION

| DESCRIPTION | DATE | FIELD BOOK |
|---|---|---|
| CROSS-SECTIONS | 11/77 | 176 |
| STR. ELEVATIONS | 12/77 | 176 |

# TORRES LATERAL

| SCRIPTION | DATE | FIELD BOO |
|---|---|---|
| ELEVATION), PHOTO-DRY-1H/H-93 | 4/73 | 1026 |

# TORTUGAS LATERAL

| ESCRIPTION | DATE | FIELD BOO |
|---|---|---|
| LEVELS (STA 362+92 LAS CRUCES LAT/ 87+44) | 8/73 | 1044 |
| ELEVATION) (AERIAL PHOTO; 1512 1/41+47) | 4/74 | 1063 |
| ELEVATIONS (AERIAL PHOTO; 41+53 / 89+09) | 3/74 | 1070 |
| TRAVERSE (77+42 / 103+42) | 12/26 | 1514 |
| TRAVERSE (0+00 / 89+66) | 1/68 | 1515 |
| TIE (SEC. COR. 133 TO STA 0+00) ~~(From ¼ bet. Secs 15 & 12 T23S R1E, 0+00/108+40)~~ | 5/19 | 1589 |
| CROSS-SECT CFOR PROPOSED HWY XING, STA 2+20) | 2/69 | 1949 |
| CONDITION PROFILE & X-SEC (0+00 / 89+50) | 10/68 | 1960 |
| CHANGE PROFILE & LOC CON BEERMAN) | 12/48 | 1963 |
| RELOCATION | 3/50 | 2029 |
| PROFILE & AUGUSTIN INVERT | 10/48 | 2030 |
| ROW (CHAINED) | 2/31 | 2041 |
| ROW LOC | 4/37 | 2044 |
| FINAL ELEV'S (0+00 / 87+44) | NO DATE | 1010 |

## Trujillo Arroyo Levee

| SCRIPTION | DATE | FIELD BOOK |
|---|---|---|
| Levee Profile (1½ miles North & South Below Perchat Dam) | 6/29 | 1693 |
| Investigation - Base Line Location | 7/31 | 1797 |
| Levee & Bank Location | 7/31 | 1797 |

TRUJILLO LATERAL

~~RICACHO CANAL~~

| ESCRIPTION | DATE | FIELD BOO |
|---|---|---|
| ~~ELEVATIONS (FINAL, LINE 32)~~ | ~~NO DATE~~ | ~~1006~~ |
| PHOTO DEZ-1HH-81 | 3/73 | 1023 |
| PHOTO DEZ-1HH-82 | 3/73 | 1023 |
| CONDITION PROFILE (0+00 / 71+99) | 11/64 | 1944 |
| FINAL ELEVIS | 12/72 | 1015 |
| LEVELS | 12/72 | 1012 |

TURNER SOUR DRAIN

| DESCRIPTION | DATE | FIELD BOOK |
|---|---|---|
| ROW TRAVERSE . (0+00 / 17+76) | 1/31 | 1893 |

# TURNEY LATERAL

| ESCRIPTION | | DATE | FIELD BOO |
|---|---|---|---|
| LEVELS | (166+26 ARMCO INT/ 12+49) | 8/23 | 1044 |
| ELEVATIONS | (AERIAL PHOTO; 12+49/12+53) | 1/24 | 1063 |
| LOCATION | (0+00/12+85) | 8/23 | 1541 |
| PROFILE | | 2/39 | 1916 |
| FINAL ELEV'S | (0+00/12+49) | NO DATE | 1010 |

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312 USCE GS

313 U.S. DETENTION FARM MAIN

314 UTTING LATERAL

USC&GS

| ESCRIPTION | DATE | FIELD BOO |
|---|---|---|
| Levels (To check the published USC&GS elevs on bench marks. USC&GS D-246 to DA-36 L-453 to M-453 to IBC-3720; F-9 to T-245) | 4/74 | 1076 |

# U.S. Detention Farm Main (LAT)

| SCRIPTION | DATE | FIELD BOOK |
|---|---|---|
| Final Locations | 2/33 | 1815 |
| H.W. & Invert Elevations | 2/34 | 1949 |
| Profile | 4/63 | 1950 |
| X. Sec For Pump Permit STA 1410 | 10/11 | 1950 |

# UTTING LATERAL

| ESCRIPTION | DATE | FIELD BOO |
|---|---|---|
| LEVELS (SEE 534+93 LAS CRUCES LAT/16+84) | 8/13 | 1044 |
| ELEVIS (AERIAL PHOTO/ 16+75/ 16+84) | 3/74 | 1070 |
| INVESTIGATION PROFILE (0+00/[redacted]) | 7/23 | 1580 |
| RELOCATION (0+00/21+12) | 8/23 | 1586 |
| RELOCATION INVESTIGATION & MEASUREMENTS | 2/42 | 1586 |
| ROW LOC. | 3/47 | 2031 |
| FINAL ELEVIS (0+00 //6+84) | NO DATE | 1010 |

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| 315 | VALLEY GATE INTERC. DRAIN |
| 316-317 | VALLEY GATE LATERAL |
| 318 | VALLEY GATE SPUR DRAIN |
| 319 | VALLEY HIGH SCHOOL DISTRICT |
| 320 | VEGA LATERAL |
| 321 | VINTON DISTRICT |
| 322 | VINTON DRAIN |
| 323 | VINTON LATERAL |
| [redacted] | |
| [redacted] | |

VALLEY GATE INTERC. DRAIN

| DESCRIPTION | DATE | FIELD BOOK |
|---|---|---|
| ROW | 6/54 | 2138 |
| CONDITION PROFILE (0+00 / 46+30) | 3/60 | 2219 |
| X-SEC (13+00) | 4/60 | 2230 |

## VALLEY GATE LATERAL

| SCRIPTION | | DATE | FIELD BOOK |
|---|---|---|---|
| CONCRETE LINING DATA | | 2/50 | 2112 |
| BREAK PROFILE | | 4/50 | 2115 |
| ROW | | 3/54 | 2138 |
| ROW | | 6/54 | 2158 |
| PROFILE | (54+83 / 95+67) | 6/57 | 2163 |
| PROFILE | (72+99 / 96+17) | 2/54 | 2166 |
| PROFILE | (OVERFLOW, 24+40 / 31+95) | 7/63 | 2259 |
| X-SEC | (6 21+00 / 123+00) | 2/65 | 2301 |
| X-SEC | | 2/69 | 2308 |

## VALLEY GATE LATERAL

| SCRIPTION | | DATE | FIELD BOOK |
|---|---|---|---|
| LEVELS | (STA 73+06) | 9/74 | 56 |
| X-SEC | (38+50/130+50) | 4/56 | 218 |
| PROFILE | (BREAK, 120+00/134+00) | 4/62 | 2187 |
| PROFILE | (SPARROW RD X-ING), 31+30 | 2/63 | 2213 |
| PROFILE | (BREAK,) | 3/63 | 2226 |

## Valley Gate Spur Drain

| SCRIPTION | DATE | FIELD BOOK |
|---|---|---|
| ROW | 3/54 | 2138 |
| CONDITION PROFILE (0+00 / 29+00) | 3/60 | 2219 |
| X-SECT (CULVERT REPLAC. @ 1+30 | 3/62 | 2219 |

GARFIELD VALLEY HIGH SCHOOL DISTRICT

| DESCRIPTION | DATE | FIELD BOOK |
|---|---|---|
| NEW MAP # 26 DATA (TRAVERSES, SUBDIV.) | 3-5/35 | 1999-2000 |

# VEGA LATERAL

## ~~AMERICAN BEND LATERAL~~

| ESCRIPTION | DATE | FIELD BOO |
|---|---|---|
| ~~ELEVATIONS (FINAL, LINE 58)~~ | ~~No Date~~ | ~~1006~~ |
| ELEVATIONS, PHOTO-DEZ-1HH-6 | 3/73 | 1024 |
| ELEVATIONS; PHOTO-DEZ-1HH-86 | 4/73 | 1025 |
| X-SECTIONS & H.W ELEV'S (TO DETERMINE CAPACITIES: 0400/21+01) | 12/73 | 1061 |
| PROFILE (FOR PITCH BREAK (21+01/34+61) | 3/67 | 1621 |
| 1964 CONDITION PROFILE (0+00/34+74) | 12/64 | 1851 |
| LEVELS | 1/73 | 1012 |

[redacted]

Vinton District

| DESCRIPTION | DATE | FIELD BO |
|---|---|---|
| OLD RID BRO LOCATION | 2/42 | 1864 |

# VINTON DRAIN

| DESCRIPTION | DATE | FIELD BOOK |
|---|---|---|
| LOCATION (0+00 / 208+00) | 5/18 | 1709 |
| MARGARET BOWLEY IRRIGATION DITCH | 10/18 | 1709 |
| ROW (0+00 / 22+91) | 2/52 | 1803 |
| PROFILE (FOR TEXAS HWY CULVERT, STA 48+91) | 7/56 | 1825 |
| ROW TRAV. LOCATION | 11/30 | 2010 |
| CULVERT | 10/47 | 2013 |

# VINTON LATERAL

| DESCRIPTION | | DATE | FIELD BOOK |
|---|---|---|---|
| LEVELS | (9+70 / 121+03) | 2/74 | 1061 |
| ELEV'S | (P.I.; 6+68 / 121+03) | 6/74 | 1085 |
| PROFILE | (73+82) | 3/21 | 1500 |
| PROFILE | (FOR NEW CHECK; 0+00 / 35+00) | 5/56 | 1504 |
| PROFILE | (0+00 / 124+30) | 4/21 | 1532 |
| R.O.W | (0+00 / 124+30) | 4/21 | 1532 |
| INVESTIGATION & X-SECT. | (STA. 83+36) | 2/25 | 1532 |
| PROFILE | (FOR EL PASO N.G.P. PIPE LINE CROSSING) | 12/61 | 1532 |
| PROFILE FOR DITCH BREAK | (110+22 / 121+03) | 6/67 | 1621 |
| CROSS-SECTION OF 12" CMP | PIPE CROSSING (STA 120+62) | 5/63 | 1851 |
| INFORMATION - FLUME OVER | VINTON DRAIN | 2/54 | 1859 |
| ~~CHECK~~ | ~~TEMPORARY BRIDGE (STATION)~~ | ~~1/54~~ | ~~1859~~ |
| CULVERT CHECK | (STA 9+70) | 5/52 | 1990 |
| CUT-OFF LAT | PROFILE (0+00 / 93+00) | 3/51 | 2001 |
| LOWER END | TRAVERSE (NEW MAP TO DATA, MESILLA VALLEY, 0+00 / 30+86) | 9/31 | 2084 |
| FINAL ELEV'S | (0+00 / 71+00) | NO DATE | 1008 |

W

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| PROFILE (BRIDGE, 14+00/24+88) | 4/66 | 22 |

WALLACE SOUR DRAIN

| SCRIPTION | DATE | FIELD BOOK |
|---|---|---|
| ROW | 2/27 | 1951 |
| ROW (CHAINED) | 9/30 | 2024 |
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| DESCRIPTION | | DATE | FIELD BOOK |
|---|---|---|---|
| LEVELS | (280+12 S. MIGUEL WALTER LAT / 48+69) | 12/75 | 1058 |
| ELEV'S | (A.P. ; 17+65 / 48+64) | 5/74 | 1080 |
| FLUME INFO. | (25+77 / 27+00) | 11/61 | 2009 |
| FINAL ELEV'S | (0+00 / 48+64) | NO DATE | 1009 |

## WANT LATERAL

| DESCRIPTION | DATE | FIELD BOO |
|---|---|---|
| LEVELS (696+54 WEST SIDE CHAIN / 98+15) | 12/13 | 1054 |
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| ELEV'S (A.P., 14432 / 48615) | 5/24 | 1082 |
| TRAVERSE (0400 / 16456) | 5/61 | 1516 |
| PROFILE (0400 / 56454) | 12/40 | 1801 |
| FLUME INVESTIGATION PROFILE OF FARM DITCH BROWN FARM | 12/40 | 1701 |
| GRADE | 1/50 | 1867 |
| RELOCATION INVESTIGATION | 11/49 | 1871 |
| X-SECT (DITCH BREAK, STA 48408) | 9/68 | 1952 |
| RELOCATION | 3/50 | 2029 |
| BREAK INFO. | 9/60 | 2043 |
| FINAL ELEVS (0400 / 48615) | NO DATE | 1009 |

Warm Spring Spur

| DESCRIPTION | DATE | FIELD BO |
|---|---|---|
| Location (0400/1100) | 3/23 | 1611 |

WARNOCK FLUME

| SCRIPTION | DATE | FIELD BOOK |
|---|---|---|
| ELEV'S (ACROSS MESA DRAIN) | 12/49 | 2113 |

WARNOCH SOUR DRAIN

| SCRIPTION | DATE | FIELD BOOK |
|---|---|---|
| TRAVERSE & ALIGNMENT | 5/53 | 3155 |
| X-SEC (AR. CROSSING, ATSO) | 2/63 | 2268 |
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## WASTE WAYS

| DESCRIPTION | DATE | FIELD BOOK |
|---|---|---|
| WW 32 A RELOC. INVEST (0+00 / 9+00) | 9/62 | 2087 |
| WW 15 BRIDGE SEE (STA 29+22) | 8/62 | 2089 |
| WW EXCAVATION - SOUTH DAM TO NORTH DAM WASTEWAY | NO DATE | 22-B |
| SOUTH DAM WW - ADDITIONAL RIPRAP | NO DATE | 23-B |
| NORTH BRANCH WASTEWAY - CHANNEL & DIKE PROFILE | NO DATE | 24-B |

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| ESCRIPTION | DATE | FIELD BOOK |
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| CROSS-SECTIONS (W.W. #32, 1+00/4+58) | 2/79 | 1115 |
| CROSS SECTIONS W.W. #20 (1+00/2+00) | 2/79 | 1115 |
| CROSS-SECTIONS W.W. #18 (0+00/2+75) | 2/79 | 1115 |
| X-SECTIONS W.W. #6 (684+00/720+00) | 6/75 | 1100 |
| X-SECTIONS W.W #5 LEASBURG (METER STATION, 0+00/0+97) | 2/79 | 1114 |
| STRUCTURE ELEVS W.W #18 RINCON | 2/79 | 1114 |
| CROSS SECTIONS W.W #16 (METER STATION) | 2/79 | 1114 |
| LEVELS & X-SECTIONS W.W #8 (0+77/28+00) | 2/79 | 1115 |
| STR. ELEVATIONS W.W #26 (CHK. 92+85 U-TROUGH CHAMBERLINE) | 2/79 | 1115 |
| LEVELS & X-SECT. W.W. #5 (0+00/1+66) | 2/79 | 1115 |
| CONDITION PROFILE W.W # 37A (0+00/23+79) | 11/65 | 1621 |
| CROSS-SECTION CULVERT PLACEMENT W.W #37A (18+37, 19+73, 20+12) | 11/65 | 1621 |
| 1965 CONDITION PROFILE W.W 32 (STA 0+00/5+63) | 2/65 | 1623 |
| 1963 CONDITION PROFILE W.W 5 (0+00/25+22) | 10/63 | 1625 |
| PICACHO W.W. 2 - CROSS-SECT. & PROFILE (0+00/61+00) | 8/22 | 1663 |
| PICACHO W.W 3 - X-SECT & PROFILE (0+00/324+00) | 8/22 | 1663 |
| ~~PICACHO W.W 1~~ - | | |
| W.W. NO 5 (LOC - E.P. ELEC. CO POWER LINE) | 5/61 | 1794 |
| ~~BARRETT FS RECLAS LAWEST~~ | ~~1/57~~ | ~~1792~~ |
| W.W #8 - PROFILE | 12/59 | |
| W.W 31 FAILURE | 4/82 | 1924 |
| W.W 32 ELEV. | 10/82 | 1925 |
| W.W 1 (TRUJILLO LAT.) CONDITION PROFILE (0+00/+21+56) | 11/64 | 1944 |
| W.W 23 MEASUREMENTS OF CHK (STA 101+85) | 3/63 | 1950 |
| W.W 19 (THREE SAINTS W. CANAL) ROW | 2/37 | 2001 |
| WW 31 PROFILE | 1/48 | 2031 |
| WW 18 PROFILE (0/20) | 7/59 | 2044 |

WASTE WAYS

~~ROADS~~ 5 ~~ROAD~~ –

| SCRIPTION | DATE | FIELD BOOK |
|---|---|---|
| ~~TRAVERSE~~ ~~COPE MCDAVID RD.~~ | ~~7/28~~ | 15/8 |
| DELIVERY BY CANALS | 1925 | 10-B |

# WEBB LATERAL

| DESCRIPTION | | DATE | FIELD BOOK |
|---|---|---|---|
| TRAVERSE & TIE | (STA 0+20 / STA 25+92) | 3/73 | 39 |
| TIE | (To beginning of CUADRILLA LAT.) | 3/73 | 39 |
| LEVELS & X-SECTIONS | (0+20 / 25+92) | 3/73 | 39 |
| STR. ELEVATIONS | (0+75 / 25+87) | 3/73 | 39 |
| X-SECTIONS | (LINED FARM DITCH BELOW HWY 80 - END OF WEBB) | 11/74 | 39 |
| CROSSING LEVELS | (DRAIN CROSSING) | 11/75 | 59 |
| TRAVERSE | (AS BUILT, 0+51 / 25+40) | 4/76 | 137 |
| CROSS-SECTIONS | (AS BUILT, 0+00 / 25+00) | 4/76 | 137 |
| STR. ELEVATIONS | (AS BUILT) | 4/76 | 137 |
| RD'S | | 8/75 | 1923 |
| CURVE DATA | | 11/75 | 1923 |
| PROFILE | (MIDDLE LAT. CROSSING, STA 86+51) | 2/50 | 2105 |
| PROFILE | (0+00 / 11+00) | 10/51 | 2132 |

WEEKS LATERAL

| DESCRIPTION | DATE | FIELD BOOK |
|---|---|---|
| LEVELS (S27+80 EAST SIDE Canal / 22+40) | 11/73 | 1055 |
| ELEVS (AP ; 11+36 / 22+40) | 5/74 | 1077 |
| LOCATION (0+00 / 67+80) | 2/23 | 1035 |
| ABANDONMENT INVESTIGATION (FOR SHANNON SINGH) | 1/57 | 1735 |
| FINAL ELEVS (0+00 / 22+40) | NO DATE | 1010 |

# WEST DRAIN

| DESCRIPTION | DATE | FIELD BK |
|---|---|---|
| X-SECTION FLUME (1000+04 | 2/64 | 1624 |
| X-SECT. FOR CULVERT REPLACEMENT (673+96, 771+04) | 1/69 | 1627 |
| CLEANING PROFILE (0+00/442+77) | 3/26 | 1682 |
| PROFILE (0+00/155+75) | 3/32 | 1734 |
| PROFILE FBM (FOR TEX. ~~HWY 87~~ GARDNER RD - CULVERT, STA 227+85) | 7/56 | 1825 |
| CULVERT (UNDER L. UNION W. CANAL; STA 142+4) | 5/59 | 1841 |
| ROSINE FLUME | 5/59 | 1841 |
| SINGH ARROYO INLET | 9/59 | 1841 |
| CULVERT INFO. | 2/44 | 1865 |
| PROFILE (AT L. UNION OLD TOWN HWY) | 2/44 | 1865 |
| FLUME SECT. (STA 249+38) | 6/26 | 1930 |
| TRAVERSE (LOWER BRANCH; STA 760+05/696+54) | 8/30 | 1997 |
| ROW INFO | 2/30 | 2002 |
| MORCAP CULVERT | 10/47 | 2012 |
| WILSON-PEBBLE RD. CROSSING | 8/98 | 2030 |
| STATIC. INVENTORY | 4/51 | 2057 |
| ROW TRAVERSE (687+83/1276+15) | 8/30 | 2071 |
| 1951-1952 MISC. PUMP PERMITS | 3/51 - 7/52 | 2072 |
| RIGHT-OF-WAY ENCROACHMENT | 3/86 | 2341 |

WEST LA WEST STORM DRAIN

| SCRIPTION | DATE | FIELD BOOK |
|---|---|---|
| ROW (6/83) | 2/27 | 1931 |
| ROW | 9/30 | 2024 |
| STRUC. INVENTORY | 4/51 | 2057 |

West La Mesa Sour "A"

| DESCRIPTION | DATE | FIELD BOOK |
|---|---|---|
| ROW (0/14) | 2/27 | 1931 |
| ROW | 9/30 | 2024 |
| STRUC INVENTORY | 5/57 | 2057 |

# West Side Canal

| ESCRIPTION | DATE | FIELD BOOK |
|---|---|---|
| LEVELS (8+97/128+83) | 11/75 | 1055 |
| LEVELS & TIE (128+83/0+25 LOWER CHAMBERINO LAT.) | 11/73 | 1056 |
| ELEV'S (AERIAL PHOTO; 48+09/80+84) | 4/74 | 1072 |
| ELEV'S (AERIAL PHOTO; 332+30/393+14) | 4/74 | 1074 |
| ELEVS (A.P. 272+44/323+69; 226+97/258+74) | 5/74 | 1078 |
| ELEVS (A.P.; 509+98/109+48) | 5/74 | 1080 |
| ELEV'S (A.P.; 692+11/722+50) | 5/74 | 1081 |
| ELEVS (A.P.; 692+07/700+25) | 5/74 | 1082 |
| HIGH WATER ELEVS (0+00/761+58) | 7/74 | 1093 |
| CROSS-SECTIONS (0+00/769+21) | 6/75 | 1101 |
| INFO. FOR PROPOSED WEST DRAIN X-ING. FOR BURT | 5/72 | 1516 |
| STAFF GAUGE SETTING (STA 422) | 2/66 | 1621 |
| X-SECT (PUMP PERMIT, 318+12) | 3/64 | 1624 |
| EXISTING BRIDGE DIMENSIONS (585+55) | 3/65 | 1624 |
| R.O.W LOCATION | 1/21 | 1699 |
| BANK PROFILE & X-SECTIONS (0+00/178+90) | 4/28 | 1701 |
| INFO FOR ERNG CO. PIPE LINES | 1/59 | 1701 |
| FAULT INVESTIGATION (0+00/50+00) | 12/24 | 1703 |
| PROFILE FOR N.M STATE RD. BRIDGE #28, STA 721+40 | 11/52 | 1741 |
| INFO. FOR HERRING LAT STATION (@ HERRING LAT. CROSSING) | 1/34 | 1859 |
| DEAN STAHMAN BRIDGE SECT (STA 198+98) | 12/25 | 1930 |
| CHECK ELEV. (STA 314+76, AS BUILT) | 12/53 | 2021 |
| SECT. FOR METERING BRD. | 11/61 | 2035 |
| FINAL ELEV'S (0+00/722+50) | NO DATE | 1009 |

# West Side Lateral

| DESCRIPTION | DATE | FIELD BOOK |
|---|---|---|
| Cross-Sections (642+76/646+00) | 2/99 | 1112 |

WEST SIDE WASTEWAY

| SCRIPTION | DATE | FIELD BOOK |
|---|---|---|
| LOCATION C0+00 / 10+61 | 10/4 | 1702 |

# WILLIAMS LATERAL

| DESCRIPTION | DATE | FIELD BOOK |
|---|---|---|
| ELEVATIONS, PHOTO-DEY-1HH-91 | 4/73 | 1025 |
| LEVELS (44+16 MESILLA LAT/ 35+58) | 9/73 | 1047 |
| ELEVATIONS (AERIAL PHOTO; ~~32+47~~ 61+69 / 35+58) | 3/74 | 1070 |
| PROFILES (0+00 / 80+00) | 2/21 | 1587 |
| ALIGNMENT (TO CLEAVES PLACE) | 3/21 | 1587 |
| FINAL LOCATION (44+94 / 35+00) | 5/21 | 1587 |
| FINAL ELEV'S (0+00 / 35+00) | NO DATE | 1007 |

Wood Lateral

| SCRIPTION | DATE | FIELD BOOK |
|---|---|---|
| Traverse | 1/53 | 1979 |
| Change Investigation for Sammy Singh | 6/59 | 1988 |
| Traverse (New Mar 26 Data, Valley H.S. District) | 5/33 | 2060 |

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| 352-A | YSLETA BRANCH | | |
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| 354 | YSLETA YARD | | |

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| DESCRIPTION | | DATE | FIELD BOOK |
|---|---|---|---|
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| TRAVERSE | (ORIGINAL, 0+50/ 54+20) | 4/77 | 164 |
| X-SEC | (MESA DR. CROSSING, STA 719+86) | 5/47 | 2096 |
| CONCRETE LINING DATA | | 2/50 | 2112 |
| RUTHERFORD TRANS. INVEST. | (41+00/55+00, REMAINS FROM DR) | 4/51 | 2115 |
| X-SEC | (W.W. REAL., 54+50) | 1/63 | 2252 |
| PROFILE | (0+00 / 55+38) | 8/60 | 2252 |
| X-SEC | (CHK REAL., 51+50, 34+25, 44+00) | 7/62 | 2297 |
| RELOCATION | | 2/71 | 2306 |

# Y-147 LATERAL

| SCRIPTION | | DATE | FIELD BOOK |
|---|---|---|---|
| X-SEC | (MESA DRAIN CROSSING, STA 666+50) | 5/47 | 2090 |
| LOCATION TRAV. & X-SEC | (STARKS FARM) | 6-7/53 | 2154 |
| X-SEC | (CNR. REAL., 62+85) | 1/63 | 2252 |
| CONDITION PROFILE | (0+00/102+76) | 10/60 | 2263 |
| X-SEC | (68+10/69+20) | 12/60 | 2263 |
| PROFILE | (BREAK, 76+00/77+90) | 4/70 | 2315 |

# Y-197 LATERAL

| DESCRIPTION | | DATE | FIELD BOOK |
|---|---|---|---|
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| STR. ELEVATIONS | (0+12 / 53+65) | 7/75 | 127 |
| R. P.'S | | 8/77 | 204 |
| X-SEC | (MESA DR CROSSING, STA 630+43) | 5/47 | 2096 |
| PROFILE | (0+00 / 51+78 | 8/60 | 2252 |
| X-SEC | (48+43) | 8/60 | 2252 |
| X-SEC | (CHK REPL. 23+00) | 4/61 | 2252 |
| PROFILE | (BREAK, 13+46 / 21+57 | 3/61 | 2252 |
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| DESCRIPTION | | DATE | FIELD BOOK |
|---|---|---|---|
| TRAVERSE | (STA 0+10/STA 24+24) | 7/75 | 126 |
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|---|---|---|---|
| TRAVERSE | (STA 0+00/STA 58+39) | 7/75 | 125 |
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| CROSS-SECTIONS | (0+12 / 58+39) | 7/75 | 125 |
| STR. ELEVATIONS | (0+12 / 58+39) | 7/75 | 125 |
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| CONDITION PROFILE | (0+00 / 58+98) | 10/60 | 2263 |
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| DESCRIPTION | DATE | FIELD BOOK |
|---|---|---|
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VSLA LATERA

| DESCRIPTION | DATE | FIELD BOO |
|---|---|---|
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| PROFILE | 11/59 | 2185 |
| CULVERT GRADE (LOMBARD CULVERT, 37+03) | 10/55 | 2185 |
| PROFILE (CHK IMPROV. 379+17/387+42) | 10/59 | 2208 |
| CONDITION PROFILE (CHK IMPROV., 19+73/183+73) | 1/60 | 2205 |
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| SCRIPTION | | DATE | FIELD BOOK |
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| STR. ELEVATIONS | (ORIGINAL, 296+93/389+55 ) | 6/77 | 154 |
| TRAVERSE | (ORIGINAL, 1+00/PI 53-87 ) | 6/77 | 182 |
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| PROFILE | (BEFORE PROD. CHANGE) 226+94/266+05) | 1/49 | 2103 |
| X-SEC | (PROPOSED CHANGE, STA 232+00/256+06) | 5/49 | 2106 |
| PROFILE | (BRIDGE REPLACEMENT, 140+00/152+00) | 10/49 | 2108 |
| PROFILE | (NAKIN 1AA16.. NEW CHK ) 0+00/33+00 | 4/51 | 2115 |
| PROFILE | (71+92/71+52) | 10/50 | 2122 |
| X-SEC | (AT NORTH LOOP RD) | 9/60 | 2124 |
| PROFILE | (RUTLEDGE WELL, STA 348+72, & WORSHAM WELL X-ING) | 2/54 | 2127 |
| X-SEC. | (WARESHAM FARM CULVERT ) | 3/52 | 2133 |
| PROFILE | (296/313) | 10/52 | 2148 |
| PROFILE | (322/355+80) | 1/55 | 2149 |
| X-SEC | (WORSHAM WELL, STA 297+34) | 10/53 | 2156 |
| X-SEC | | 1/54 | 2156 |
| X-SEC | (ADAMS WELL, 244+16) | 8/54 | 2164 |
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| CHK | (C.A. BROWN, STA 183+52) | 1/55 | 2175 |
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| PROFILE | | 3/55 | 2178 |

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| DESCRIPTION | | DATE | FIELD BOOK |
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# V/SLETA BRANCH

~~BATTELLE [illegible]~~

| SCRIPTION | DATE | FIELD BOOK |
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[redacted]

VISTA SEWAGE PLANT

| SCRIPTION | DATE | FIELD BOOK |
|---|---|---|
| LOCATION (OUTFALL PIPE) | 11/49 | 2108 |

# YSLETA YARD

| DESCRIPTION | DATE | FIELD |
|---|---|---|
| LEVELS (TO YSLETA YARD) | 3/73 | 1912 |
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ZACK LATERAL

| DESCRIPTION | DATE | FIELD BOOK |
|---|---|---|
| LEVELS (20+07 / 18+07) | 3/74 | 1069 |
| ELEVS (A.P.; SIPHON (A.V. VAULT / 20+07) | 7/74 | 1087 |
| CHECK (36" CONC. REPLACEMENT) | 5/51 | 2021 |
| FINAL ELEVS (0+00 / BS+00) | NO DATE | 1005 |

Department of the Interior
Bureau of Reclamation
Rio Grande Project
New Mexico - Texas

DEPARTMENT OF JUSTICE
BUREAU OF PRISONS

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DEPARTMENT OF THE INTERIOR

BUREAU OF RECLAMATION

RIO GRANDE IRRIGATION PROJECT

# MEMORANDUM OF INTERDEPARTMENTAL AGREEMENT

Dated June 10, 1931

Between

DEPARTMENT OF JUSTICE

and

DEPARTMENT OF THE INTERIOR

Providing
For the Irrigation of the United
States Detention Farm

THIS memorandum of agreement made this 10th day of June, 1931, by and between the Department of Justice, represented by the Attorney General, pursuant to the provisions of the Second Deficiency Act, fiscal year 1931, approved March 4, 1931 (Public 869 - 71st Congress, Page 26), and the Department of the Interior, represented by the Acting Secretary of the Interior, pursuant to the Act of Congress of June 17, 1902 (32 Stat. 388) and acts amendatory thereof and supplementary thereto, collectively known as the Reclamation Law,

WITNESSETH, that

Recitals

1. WHEREAS the Rio Grande federal reclamation project, comprising lands situated in New Mexico and Texas, was constructed pursuant to the Reclamation Law and is being operated and maintained by the Bureau of Reclamation of the Department of the Interior pursuant to said law and existing contracts between the United States and the Elephant Butte Irrigation District and the El Paso County Water Improvement District No. 1, public corporations, dated June 15, 1918, and January 17, 1920, respectively and

2. WHEREAS water rights under the Elephant Butte reservoir of said project have been by said contracts apportioned to an irrigable area of 88,000 acres of land in the Elephant Butte Irrigation District in New Mexico and to an irrigable area of 67,000 acres in the El Paso County Water Improvement District No. 1 in Texas, based upon assumption by said districts of the obligation to repay their proportionate share of the construction costs of the Elephant Butte reservoir

and related works, and

3. WHEREAS, by reason of seepage and other conditions the irrigable area in said El Paso County Water Improvement District No. 1, hereinafter referred to as the District, may ultimately fall below said 67,000 acres, and

4. WHEREAS a discrepancy may thereby result between the total construction cost which the District is under existing contracts obligated to repay to the United States, and the total final irrigable area which may be found in said District resulting in a greater cost to district lands per irrigable acre than would otherwise have resulted if said entire 67,000 acres were susceptible of being reclaimed without expenditures beyond said total contractual obligation, but it is anticipated that the expenditures to be incurred by the Department of Justice by the provision and operation, all at its expense, of necessary pumping facilities as in Article 14 hereinafter provided, in addition to the sum of ninety dollars ($90.00) per acre construction charge payment, will more than equal such potential excess cost which may have to be borne by the district lands in the event of ultimate deficiency in the irrigable area within said District, and

5. WHEREAS it is provided by Articles 9 and 13 of the said contract between the United States and the El Paso County Water Improvement District No. 1 that if the Secretary of the Interior shall deem any lands of the project permanently unsusceptible of reclamation on account of seepage or other conditions, he may, in his discretion contract with the said District for the severance

of the water rights from such lands and for such water rights to become appurtenant to other lands within or without the District and for a proportionate reduction of the District's obligations under said contract, and

6. WHEREAS the Secretary of the Interior deems 635 acres of said district lands, potentially to be permanently unsusceptible of reclamation on account of seepage or other condition, the particular location and description of which said lands are to be at some future time designated, and the Secretary of the Interior desires to contract with the District, such contract to be evidenced by the approval of this agreement by the Board of Directors of said District, for the immediate transfer of water rights from 400 acres of district lands to 400 acres within a tract of land situated near the village of La Tuna, Texas, and hereinafter more particularly described and referred to as the prison farm lands, acquired by the United States for use of the Prison Bureau of the Department of Justice, and to provide for the possible future transfer of additional water rights from district lands to an additional area of not to exceed 235 acres of said prison farm lands.

WHEREAS the United States, acting through the Department of Justice and the Prison Bureau thereof contemplates the establishment of a Federal Prison Detention Farm on said prison farm lands and desires to procure and make appurtenant to said lands for irrigation purposes, a primary project water right under the Rio Grande project similar to the water rights under said project appurtenant to lands in the El Paso County Water Improvement District

No. 1, and

8. WHEREAS provision has been made by Congress for the payment by the Department of Justice of the sum of thirty-six thousand dollars ($36,000.00) for the immediate acquisition of such water right for 400 acres of the said prison farm lands, and such additional sum as may be necessary for the provision of the necessary pumping facilities, and

9. WHEREAS said prison farm lands may be reached by connection with or an extension of existing project canals serving lands in said El Paso County Water Improvement District No. 1, but at a level requiring elevation of water from such connecting ditch by pumps for delivery to and distribution upon said prison farm lands and the Department of Justice being prepared to install and operate such pumping facilities as may be necessary for such purpose, all at the expense of the Department of Justice,

10. NOW, THEREFORE, the premises considered, it is agreed that:

Water Rights to Become Appurtenant to Prison Farm Lands.

11. A water right for 400 acres under the Rio Grande Irrigation Project, of like character to that appurtenant to irrigable lands generally within the El Paso County Water Improvement District No. 1 under said project shall, and is hereby, subject to the approval of said District, transferred from 400 acres of land now within the said District and shall become and is hereby declared to be appurtenant to the said hereinafter described prison farm lands, and which said lands are included within a tract lying and situated in the County of El Paso and State of Texas, and more particularly

described in two parcels as follows, to-wit:

That certain tract or parcel of land, part of Maria Rodriguez Survey No. 35, El Paso County, Texas, same being bounded on the north by G. W. Beard, Clara Mundy Potter and Craig Belk tracts; on the east by Frank Wells Brown tract; on the south by Clara Mundy Potter and Helen Gilroy tracts; and on the west by Helen Gilroy tract and State Highway No. 1, and being more particularly described as follows:

Beginning at a concrete monument set at the intersection of the north line of Maria Rodriguez Survey No. 35 with the east line of State Highway No. 1 for the northwest corner of this tract. Thence east with said northerly line of said Rodriguez Survey 5669.9 feet to a concrete monument set for the northeast corner. Thence south 5000 feet to a concrete monument set for the southeast corner of this tract. Thence west 3043 feet to concrete monument set for the lower southwest corner of this tract. Thence north 2425 feet to a concrete monument set for a re-entrant corner of this tract. Thence west 2491.9 feet to a concrete monument set in said easterly line of said highway for the upper southwest corner of this tract. Thence north 3° west with said easterly line of said highway 2478.5 feet to the place of beginning, and containing five hundred and fifty-nine one-hundredths (500.59) acres of land.

Parcel No. 2

And that certain tract or parcel of land, part of Maria Rodriguez Survey No. 35, El Paso County, Texas, and adjoining the Ed. L. Christian tract on the north and east sides and the Clara Mundy Potter tract on the south side, and being bounded on the west side by State Highway No. 1, and more particularly described as follows:

Beginning at a concrete monument set in the east line of State Highway No. 1 for the northwest corner of this tract, said corner being south 3° east 2478.5 feet from a concrete monument in the north line of Maria Rodriguez Survey No. 35 and in the east line of said highway. Thence from said beginning corner east 2491.9 feet to a concrete monument set for the northeast corner of this tract. Thence south 2425 feet to a concrete monument set for the southeast corner of this tract. Thence west 2364.9 feet to a concrete monument set in said east line of said highway for the southwest corner of this tract. Thence north 3° west with said east line of said highway 2428.3 feet to place of beginning, and containing one hundred and thirty-five and nineteen one-hundredths (135.19) acres of land.

Payment on Account of Project Construction Cost

12. Upon the execution of this memorandum of agreement and its approval by resolution of the Board of Directors of the El Paso County Water Improvement District No. 1, the Attorney General shall cause to be paid to the Secretary of the Interior the sum of Thirty-six thousand Dollars ($36,000.00) as full payment of the proportionate part of the Rio Grande project construction cost hereby allocated to said four hundred acres of prison farm lands. Upon receipt thereof The Secretary of the Interior will utilize so much of said sum of $36,000.00 as may be necessary for that purpose for the construction of the canal extension or connection provided for in Article 14 hereof and the balance then remaining of said sum of $36,000.00 will be deposited in the Reclamation Fund to be credited to that part of the Rio Grande project construction cost allocated to the El Paso County Water Improvement District No. 1 and the obligations of said District to the United States on account of construction charges under existing contracts repayable by said District shall be reduced to that extent.

Additional Water Right May be Acquired

13. At any time hereafter, without other approval by or contract with the El Paso County Water Improvement District No. 1, than that contained herein, the payment by the Attorney General to the Secretary of the Interior of a construction charge of ninety dollars ($90.00) per acre for each additional acre of said prison farm lands in excess of the 400 acres above mentioned, for which the Department of Justice may hereafter desire to acquire a project

water right, shall effect a transfer from district lands to said prison farm lands of an additional project water right to the extent of such additional payment or payments, provided that there shall be at that time an area of like quantity of district lands unsusceptible of reclamation on account of seepage or other conditions, from which said additional water right may be severed and provided that all facilities for the utilization of such additional water right shall be provided at its own expense by the Department of Justice. Upon such additional payment or payments by the Attorney General, the existing contractual obligations of the El Paso County Water Improvement District No. 1 shall be further reduced to the extent thereof in manner similar to that set forth in Article 12 hereof.

Canal Connection and Pumping Facilities

14. Upon payment of said sum of Thirty-six Thousand Dollars ($36,000) as in Article 12 provided, the Bureau of Reclamation will construct as a part of the Rio Grande project, utilizing so much of said sum of $36,000 as may be necessary for that purpose as provided in Article 12 hereof, an extension of an existing project gravity flow canal to some feasible point at or conveniently near said prison farm lands, to which the project water supply may be carried by gravity flow, or in lieu thereof a connecting ditch between such point and such existing canal, and the same will be operated and maintained as apart of the Rio Grande project system by the Bureau of Reclamation and its successors in the operation of and maintenance of the Texas division of said project. The Department of Justice will, at its own expense, provide, operate and

maintain all necessary pumping facilities for the elevation of the water from said gravity flow canal and to accomplish the distribution of said water supply upon said prison farm lands and said pumping equipment shall be and remain the property of the Department of Justice.

Water for Irrigation to be Supplied

15. Upon payment being made as in Article 12 hereinabove provided and upon establishment of the connection between the present project canal system and some feasible point upon or near the above described tract of land, a water supply for four hundred acres of said land and for such additional acreage as may hereafter be entitled to receive such supply under the provisions of Article 13 hereof, will be delivered to such point by the Bureau of Reclamation and by its successor in the operation and maintenance of the Texas Division of the Rio Grande project, subject to elevation and distribution of said water upon said lands by and at the expense of the Department of Justice and otherwise subject to like conditions of water service and like proration in case of shortage as pertain to other lands under said project, except as may be herein otherwise specifically provided.

Annual Operation and Maintenance Charge

16. The Attorney General will cause to be paid annually to the Special Fiscal Agent, Bureau of Reclamation, El Paso, Texas, responsive to bills therefor to be rendered by the Bureau of Reclamation, a minimum per acre operation and maintenance charge on four hundred acres of said described lands and on each additional

acre for which a water right may have been acquired as in Article 13 hereinabove provided whether the same are irrigated or not, which charge shall be the same and entitle the said lands to the same quantity of irrigation water as the minimum per acre operation and maintenance charge payable by project water users whose lands are in the El Paso County Water Improvement District No. 1, and in addition thereto shall cause to be so paid as a part of the annual operation and maintenance charge, a charge per acre foot of water in excess of that to which payment of said minimum annual operation and maintenance charge shall entitle said prison farm lands, which per acre foot charge shall be the same as that payable as excess water charge by District water users, provided, however, that such payment in this article provided shall not commence until the project canal system shall have been extended or connecting ditch constructed as in Article 14 hereinabove provided, and as to any additional area not later than for the year in which water rights may have been transferred to such additional area.

Consent of Secretary to Future Exclusion of Lands from the District

17. The Secretary of the Interior hereby consents, upon the payment by the Attorney General of the sum provided in Article 12, to the exclusion from the El Paso County Water Improvement District No. 1 of lands which may have become permanently unsusceptible of reclamation on account of seepage or other conditions to the extent that water rights may have beentransferred from district lands to said prison farm lands, which said lands so unsusceptible of exclusion from the District, will at some future

time be more particularly described and designated, and the approval of this memorandum of agreement by the said District shall constitute such contract between the District and the Secretary of the Interior as is mentioned in Article 5 hereinabove.

Cooperative Work Upon Request of Director of Prisons

18. Upon request of the Director of Prisons and the provisions by the Department of Justice of funds therefor the Bureau of Reclamation will prepare plans and estimates and/or construct such irrigation facilities for said prison farm lands as may be so requested and for which funds may be so provided by the Department of Justice and made available for expenditure by the Bureau of Reclamation.

IN WITNESS WHEREOF the Attorney General and the Acting Secretary of the Interior have hereunto subscribed their official signatures the day and year first above written.

William D. Mitchell
Attorney General
S.B.

Jos. M. Dixon
Acting Secretary of the Interior
E.E.R. P.W.D.

Approved:

El Paso County Water Improvement District No. 1

By: T.D.Porcher, President.

Attest:

K. B. Ivey, Acting Secretary.

A PORTION OF THE MINUTES OF A MEETING OF
THE BOARD OF DIRECTORS OF EL PASO COUNTY WATER IMPROVEMENT
DISTRICT NO. 1 HELD JULY 1, 1931

Due consideration having been given the memorandum of agreement entered into on the 10th day of June, 1931, by and between the Department of Justice and the Department of Interior providing for a water right, under the said terms of agreement, for 400 acres of land situated near the village of La Tuna, Texas acquired by the Department of Justice for use as a prison farm, on motion of Mr. Mebus, seconded by Mr. Frist and carried, the said memorandum of agreement was approved.

C E R T I F I C A T E

I hereby certify that the above and foregoing is a true and correct copy of that portion of the Minutes covering the matter of the memorandum of agreement entered into by the Department of Justice and the Department of Interior on the 10th day of June, 1931.

Witness my hand and seal this 1st day of July, 1931

K.B.Ivey,
Acting Secretary

(SEAL)

Department of the Interior
Bureau of Reclamation
Rio Grande Project - New Mexico-Texas

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MEMORANDUM OF AGREEMENT

Between

DEPARTMENT OF STATE

And

DEPARTMENT OF THE INTERIOR

Dated

August 28, 1934

**Transfer of Rio Grande Rectification Project from International Boundary Commission to Bureau of Reclamation for making changes in Rio Grande Project works resulting from the Rectification Project.**

COPY - mcf

THIS MEMORANDUM OF AGREEMENT made this 28th day of August, 1934, between the Department of State, represented by the Acting Secretary of State, and the Department of the Interior, represented by the Secretary of the Interior, pursuant to the provisions of the Act approved May 21, 1920 (U.S.C., Title 31, Sec. 686), as amended by Section 601 of the Act approved June 30, 1932 (47 Stat., 417),

WHEREAS provision is made under the terms of the Convention of February 1, 1933, between the United States and Mexico for the rectification of the channel of the Rio Grande between a point near El Paso and Fort Quitman, Texas, and

WHEREAS certain funds have been alloted to the Secretary of State by the Administration of Public Works for the purpose of constructing such rectification works as may be for accomplishment by the United States, and

WHEREAS the American Commissioner of the International Boundary Commission, United States and Mexico, hereinafter referred to as American Commissioner, is engaged upon the construction of such rectification works and

WHEREAS a part of the said rectification works pass through or are adjacent to a portion of the Rio Grande Federal Irrigation Project which has been constructed and is being operated and maintained by the Department of the Interior through its Bureau of Reclamation pursuant to the Act of June 17, 1902 (32 Stat. 388), and

WHEREAS the construction of the said rectification works will necessitate the removal, alteration, construction and reconstruction of certain canals, laterals, drains and appurtenant structures forming a part of the works of said irrigation project, and the consequent works will become a part of said irrigation project and will be operated by the Bureau of Reclamation, which may conveniently construct such works through a transfer of funds for that purpose from the Department of State to the Department of the Interior, Bureau of Reclamation.

NOW, THEREFORE, it is agreed as follows:

(1) Upon request of the American Commissioner for the design or construction of any canal, lateral, drain, or any irrigation work of any character (in connection with the rectification works to be constructed by the United States under the convention mentioned above) addressed to the Superintendent of the Rio Grande Project of the Bureau of Reclamation, accompanied by a transfer to said Bureau of funds to the extent of the estimated cost of such design or construction as the same may be estimated by the American Commissioner at the time of such request, the Bureau of Reclamation will accomplish such design or construction in accordance with such request using therefor the funds so transferred.

(2) When amounts so transferred are determined to be insufficient to complete such design or construction as the same may be requested, additional sums shall be advanced.

(3) The sums so transferred to the Bureau of Reclamation shall be used in the performance of the work so requested to the extent of the actual cost thereof, including the cost of materials and supplies, labor, use of equipment, personal services engaged directly upon such work and a reasonable overhead cost embracing superintendence and accounting, engineering and inspection and general expense. The funds so transferred shall also be chargeable with the cost of equipment purchased for use in connection with such work to the extent that any such purchase may be approved in advance by the American Commissioner, providing that upon completion of such work any equipment so purchased shall become and remain the property of the American Section of the International Boundary Commission.

(4) The American Commissioner shall acquire all lands and rights-of-way needed by the Bureau of Reclamation for construction of the irrigation works contemplated by paragraph (1) of this article.

(5) Upon completion of any work so requested proper adjustments on the basis of the actual cost of the materials, supplies, or equipment furnished or work or services performed will be made and any portion of the funds so transferred then remaining unexpended shall be retransferred to the appropriation for the Rio Grande Rectification Project.

IN WITNESS WHEREOF the Acting Secretary of State and the Secretary of the Interior have hereunto subscribed their official signature the day and year first above written.

/s/ William Phillips
Acting Secretary of State

Secretary of the Interior

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
RIO GRANDE PROJECT
211 U. S. COURT HOUSE
EL PASO, TEXAS

IN REPLY
REFER TO:

Mgr

April 1, 1958

Hon. L. H. Hewitt
Commissioner, United States Section
International Boundary and Water Commission
P. O. Box 1859
El Paso, Texas

Dear Col. Hewitt:

Your letter of March 31, 1958, relative to a request of Mr. Alvin M. Macholski of 365 Ben Swain Drive, having made an application to operate a horse corral on Government land adjoining his residence, is acknowledged.

The second paragraph of your letter points out that the Boundary Commission acquired this right of way for the Bureau of Reclamation in pursuance of a Memorandum of Understanding between the Department of State and the Department of the Interior, dated August 28, 1934.

I concur with your statement that this is right of way of the Bureau of Reclamation, and we will accordingly assume jurisdiction of the right of way in this area for the Valley Gate Lateral, Ascarate Wasteway, and the Valley Gate Intercepting Drain down to the right of way line for the levee. A copy of your letter and a copy of this letter is being attached to our copy of the Agreement.

Sincerely yours,

W. F. Resch
Project Manager

C O P Y

INTERNATIONAL BOUNDARY AND WATER COMMISSION
United States and Mexico
206 San Francisco Street
El Paso, Texas

March 31, 1958

Mr. W. F. Resch,
Project Manager, Bureau of Reclamation,
United States Courthouse,
El Paso, Texas.

Dear Mr. Resch:

Mr. Alvin M. Pacholski, who resides at 365 Ben Swain Drive, Miller's Lakeside Addition, has applied to this agency for a right to operate a horse corral, to stable one horse, on Government land adjoining his residence. Enclosed is a copy of our map No. 1559-36B, dated December 8, 1934, on which Mr. Pacholski has sketched in pencil the area proposed to be affected.

As you will note, this appears to be on right-of-way acquired by us in the name of the United States for structures of the Bureau of Reclamation exclusively, which were constructed and are being operated and maintained by your agency in pursuance of a Memorandum of Understanding between the Department of State and the Department of Interior dated August 28, 1934. It therefore appears that this is right-of-way of the Bureau of Reclamation. Please write me if we are in agreement.

If you agree with our views and anything further is required to supply an apparent omission of an express transfer of jurisdiction in the reference Memorandum, our exchange of letters on the subject will supply that apparent omission.

Sincerely yours,

/s/ L. H. Hewitt

L. H. Hewitt
Commissioner

Enclosure:
IBWC Dwg. No. 1559-36B

DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
RIO GRANDE IRRIGATION PROJECT
NEW MEXICO - TEXAS

# INTERDEPARTMENTAL AGREEMENT

between

DEPARTMENT OF STATE

and

DEPARTMENT OF THE INTERIOR

Dated

October 9, 1935

Regarding Caballo Reservoir

THIS MEMORANDUM OF AGREEMENT made this 9th day of October, 1935, between the Department of State, represented by the Secretary of State, and the Department of the Interior, represented by the Secretary of the Interior, pursuant to the provisions of the Act approved May 21, 1930 (U.S.C., Title 31, Sec. 686) as amended by Section 601 of the Act approved June 30, 1932 (U.S.C., Suppl. VII, Sec. 686), and the Convention for the Rectification of the Rio Grande of February 1, 1933, between the United States and Mexico (48 Stat. 1621).

WITNESSETH, that

WHEREAS, provision is made by the Convention and the annexes attached thereto for the Rectification of the Rio Grande in the El Paso-Juarez Valley concluded February 1, 1933, between the United States and Mexico, hereinafter referred to as the Rectification Treaty, for the construction by the United States, under the direction and inspection of the International Boundary Commission, United States and Mexico, of a flood control and channel stabilization project including a flood detention dam and reservoir of not less than 100,000 acre feet capacity at Caballo, New Mexico, hereinafter referred to as the Rectification Project, and

WHEREAS, the cost of construction of such a dam and reservoir and the site therefor has been estimated to be $1,500,000 and whereas there have been allotted to the Department of State, pursuant to the provisions of Title II of the Act approved June 16, 1933, funds to the extent of a part of the estimated cost of the Rectification Project,

WHEREAS, the Bureau of Reclamation, considering that a high dam rather than a low dam should be built, has applied for and received an allotment of funds under Title II of the Act approved June 16, 1933, in the sum of $100,000 and under the Relief Appropriation Act of 1935 approved April 8, 1935, an allotment of funds in the sum of $900,000 for the construction at Caballo of a high dam for the creation of a reservoir for development of hydro-electric power, and

WHEREAS, it is the desire of the Secretary of the Interior that a high dam at Caballo be constructed by the Bureau of Reclamation to which the Secretary of State is agreeable subject to assurance of facility for compliance with the terms of the Rectification Treaty by retention in the Government in perpetuity of title to and control of Caballo dam and reservoir, the reservation therein for flood control purposes of at least one hundred thousand acre feet of storage capacity and retention in the Department of State of the control and operation of and the release of water from the reservoir so far as flood discharges are concerned, to be effected as hereinafter set forth.

NOW, THEREFORE, it is agreed as follows:

1. There shall be transferred to the Department of the Interior for direct expenditure by the Bureau of Reclamation in connection with the acquisition of site for and construction of a high dam and reservoir at Caballo, from funds heretofore allotted to the Department of State in connection with the Rectification Project under Title II of the National Industrial Recovery Act approved June 16, 1933, the sum of $1,500,000. After the determination of the actual cost of the high dam, the Secretary of the Interior shall submit a statement to the Secretary

of State setting out first, the total cost of the dam and reservoir, and, second, the part of this amount which is chargeable to the rectification project based on the relation which the estimated cost of the high dam bears to the estimated cost of the low dam for rectification purposes, as set out in the Bureau of Reclamation estimate of November 24, 1934. Should this amount be less than the $1,500,000 transferred by this agreement, then the remainder shall be retransferred to the Department of State for direct expenditure on the rectification project as contemplated in the original allotment.

2. The memorandum of agreement between the Secretary of State and the Secretary of the Interior dated March 2, 1935, providing for the transfer to the Department of State of $100,000 heretofore allotted to the Department of the Interior, shall be terminated and superseded by this memorandum of agreement.

3. The Bureau of Reclamation of the Department of the Interior shall thereupon proceed with the acquisition of the necessary lands and with the design and construction of a dam on the Rio Grande at the Caballo Dam site in New Mexico, and the appurtenant reservoir. In order that compliance may be had with the Rectification Treaty, the plans shall be furnished to the American Commissioner of the International Boundary Commission, United States and Mexico, and there shall be acquired by and retained in perpetuity in the Government title to and control of Caballo dam and reservoir. There shall always be reserved in said reservoir at least one hundred thousand acre feet of storage capacity for flood control purposes. There shall be retained in the Department of State the control of the operation

and the release of water from the reservoir so far as flood discharges are concerned to the extent that the Department of the Interior or any other Federal agency which may hereafter carry on the actual operation of the said Caballo Dam shall so operate the same as to reserve therein the necessary flood storage capacity, and so release water which may reach the Caballo Reservoir in any manner, whether as a result of flood runoff or spills from or releases from Elephant Butte Dam or otherwise, to the end that the combined flow of water so released from Caballo Dam and water otherwise in the river below the same shall not at the point of beginning of the rectified channel of the Rio Grande constructed under the Rectification Treaty, exceed 11,000 cubic feet per second, to the extent that such regulation may be accomplished with the reserved flood control capacity. This shall be accomplished according to such detailed arrangements as may hereafter from time to time be effected between the Superintendent of the Rio Grande Irrigation Project or in case he may in the future be succeeded by an agent of the water users' organization or organizations on said irrigation project, then between other appropriate official of the Department of the Interior and the American Boundary Commissioner designated under the Boundary Convention of 1889 between the United States and Mexico. In order to render effective the foregoing provisions, appropriate provision therefor will accordingly be made in any contract or contracts hereafter negotiated on behalf of the Government by the Department of the Interior having to do with uses of water involving Caballo dam and reservoir.

4. Upon completion of construction of the Caballo dam and reservoir the same, subject to the provisions of the preceding paragraph hereof, shall be operated and maintained by the Department of the Interior.

5. After the transfer of funds has been effected as elsewhere herein provided the Department of State shall be relieved of making any further reports concerning labor, accounts, contracts, and of furnishing data or information of any nature which may be required by law, Executive Order or regulation in connection with the expenditure of the transferred funds and all of such reports and information shall be furnished to the proper agency by the Department of the Interior.

6. The construction, operation and maintenance by the Department of the Interior of a power plant to utilize waters released at the Caballo Dam shall not interfere in any way with the primary use for flood control purposes of the storage capacity reserved for that purpose.

IN WITNESS WHEREOF the Secretary of State and the Secretary of the Interior have hereunto subscribed their official signatures the day and year first above written.

/s/ Cordell Hull
Secretary of State

/s/ Harold L. Ickes
Secretary of the Interior.

INTERNATIONAL BOUNDARY COMMISSION
United States and Mexico
First National Bank Bldg.

Office of the Commissioner
United States Section — El Paso, Texas

September 25, 1942

Mr. L. R. Fiock, Superintendent,
Rio Grande Project,
Bureau of Reclamation,
U.S. Courthouse,
El Paso, Texas.

Dear Mr. Fiock:

This will acknowledge the receipt of your letter of September 24, 1942, with which you transmitted in graph form a proposed program of operation of Elephant Butte and Caballo Reservoirs covering the period October 1, 1942 to July 1, 1943. It is understood that this program is subject to review by the Chief Engineer of the Bureau of Reclamation.

It is noted that the proposed program contemplates that on June 1, 1943 there will be available in the Caballo Reservoir approximately 100,000 acre feet of flood control storage.

This office perceives no objection to the program as depicted by the graph and would appreciate receiving three additional copies thereof when it is in final form.

Very truly yours,

For the Commissioner:

/c/ C.M. Ainsworth

C.M. Ainsworth
Consulting Engineer

INTERNATIONAL BOUNDARY COMMISSION
United States and Mexico
First National Bank Bldg.

Office of the Commissioner
United States Section

El Paso, Texas

March 16, 1942

Mr. L.R. Fiock, Superintendent,
Rio Grande Project
Bureau of Reclamation,
United States Court House,
El Paso, Texas.

Dear Mr. Fiock:

This will acknowledge the receipt of your letter of March 12, 1942 in which you report on the present status of water in storage in the Caballo and Elephant Butte Reservoirs and on the conclusions as to probable amount of inflow into Elephant Butte Reservoir that may be made on the basis of the snow survey report for March 1, 1942.

You also request in your letter advice as to the requirements of this Commission relative to the portion of the Caballo Reservoir storage capacity which has been designated for flood control purposes for the coming season.

Since the high dam at Caballo was constructed with the definite agreement that 100,000 acre feet of the capacity should always be reserved for flood control purposes, and since flood inflows into the reservoir may be anticipated during the summer season, it is considered by this office that the 100,000 acre feet of reserved storage capacity in the Caballo Reservoir should be available for flood control purposes on the first of June of this year.

Very truly yours,

/s/ L.M. Lawson
L.M. Lawson
Commissioner

INTERNATIONAL BOUNDARY COMMISSION
United States and Mexico
First National Bank Bldg.

Office of the Commissioner
United States Section

El Paso, Texas

December 6, 1941

Mr. L.R. Fiock, Superintendent,
Rio Grande Project,
Bureau of Reclamation,
United States Court House,
El Paso, Texas.

Dear Mr. Fiock:

I have your letter of December 4, 1941, with regard to the present plan of operation of the Elephant Butte and Caballo reservoirs for the 1942 season.

I note it is now expected that it will not be necessary to make releases from the Elephant Butte reservoir in addition to those for power generation, at least until February 15, 1942, and that irrigation releases from the Caballo reservoir will begin about February 1, 1942.

With regard to the possible encroachment upon the uppermost 100,000 acre-feet of storage capacity in the Caballo reservoir, no objection is perceived to such operation at this time of the year in as much as such action was contemplated in the rectification treaty and the respective interdepartmental agreement.

It will be much appreciated if you will advise this office from time to time as revisions are made in the plan of operation for the storage reservoirs.

Very truly yours,

/s/ L.M. Lawson

L.M. Lawson
Commissioner

12-12-41 El Paso, Texas
cc-Commissioner
-Chief Engineer

THIS MEMORANDUM OF AGREEMENT, made this 5th day of June, 1936, between the Department of State, represented by the Secretary of State, and the Department of the Interior, represented by the Secretary of the Interior, pursuant to the provisions of the Act approved May 21, 1920, (U.S.C., Title 31, Sec. 686) as amended by Section 601 of the Act approved June 30, 1932, (47 Stat., 417) witnesseth:

WHEREAS, the Department of State Appropriation Act, 1937, contains an item of one million two hundred thousand dollars ($1,200,000) to be immediately available for the construction of the Rio Grande rectification project under the supervision of the American Section of the International Boundary Commission, United States and Mexico, and

WHEREAS, in accordance with the terms of an agreement dated August 28, 1934, between the Acting Secretary of State and the Secretary of the Interior, the Bureau of Reclamation, Department of the Interior, is engaged in building certain works incidental to and a part of the said Rio Grande rectification project adjacent to a portion of the Rio Grande Federal Irrigation Project, and

WHEREAS, it is desired that the Bureau of Reclamation shall continue the construction work in reference,

NOW, THEREFORE, it is agreed:

(C O P Y)

THAT the Bureau of Reclamation will continue this work and that, in order that this may be done, the Secretary of State will transfer to the Secretary of the Interior the sum of fifty thousand dollars ($50,000) from the above-mentioned appropriation and such additional amounts as may be required to effect the purposes set forth in the agreement of August 28, 1934.

IN WITNESS WHEREOF, the Secretary of State and the Secretary of the Interior have hereunto subscribed their official signatures the day and year first above written.

(Sgd) Cordell Hull
Secretary of State

(Sgd) Harold L. Ickes
Secretary of the Interior.

C O P Y

THIS MEMORANDUM OF AGREEMENT, made this 19th day of July, 1937, between the Department of State, represented by the Secretary of State, and the Department of the Interior, represented by the Secretary of the Interior, pursuant to the provisions of the Act approved May 21, 1920, (U.S.C., Title 31, Sec. 686) as amended by Section 601 of the Act approved June 30, 1932, (47 Stat., 417) witnesseth:

WHEREAS, the Department of State Appropriation Act, 1938, contains an item of eight hundred seventy-five thousand dollars ($875,000) made available for the construction of the Rio Grande rectification project under the supervision of the American Section of the International Boundary Commission, United States and Mexico, and

WHEREAS, in accordance with the terms of an agreement dated August 28, 1934, between the Acting Secretary of State and the Secretary of the Interior, the Bureau of Reclamation, Department of the Interior, is engaged in building certain works incidental to and a part of the said Rio Grande rectification project adjacent to a portion of the Rio Grande Federal Irrigation Project, and

WHEREAS, it is desired that the Bureau of Reclamation shall continue the construction work in reference,

NOW, THEREFORE, it is agreed:

THAT the Bureau of Reclamation will continue this work and that, in order that this may be done, the Secretary of State will transfer to the Secretary of the Interior the sum of fifty thousand dollars ($50,000) from the above-mentioned appropriation and such additional amounts as may

be required to effect the purposes set forth in the agreement of August 28, 1934.

IN WITNESS WHEREOF, the Secretary of State and the Secretary of the Interior have hereunto subscribed their official signatures the day and year first above written.

(Sgnd.) Cordell Hull
Secretary of State

(Sgnd.) Charles West
Secretary of the Interior

THE SECRETARY OF THE INTERIOR

WASHINGTON

December 22, 1941

Secretary, Dec. 19, 1941
For Signature

My dear Mr. Secretary:

Reference is made to your letter of December 12 (your reference RA 711.1216 Canalization/601) in regard to a transfer of 2.56 acres of land in Dona Ana County, New Mexico, from the jurisdiction of the Department of the Interior to the Department of State for use in connection with the Rio Grande Canalization Project.

I have signed the agreement enclosed with your letter and deliver the same to you herewith conditioned upon receipt from your Department of $179.20 to be covered into the Reclamation fund.

Sincerely yours,

/s/ John J. Dempsey
Acting Secretary of
the Interior

Hon. Cordell Hull,

Secretary of State.

Enclosure 2837785

Copy for CE Denver, Colo.
DC Amarillo, Texas.
Supt., El Paso, Texas.
(with copy of agreement to each)

AGREEMENT
BETWEEN THE DEPARTMENT OF THE INTERIOR
AND THE DEPARTMENT OF STATE

THIS MEMORANDUM OF AGREEMENT, made this 12th day of December, 1941, between the Department of the Interior, represented by the Secretary of the Interior, and the Department of State, represented by the Secretary of State,

WITNESSETH That,

WHEREAS, the hereinafter described tract of land is owned by the United States and is now under the control and jurisdiction of the Department of the Interior, and

WHEREAS, the Secretary of State has requested the transfer of such tract to the control and jurisdiction of the Department of State, to be used in connection with the Rio Grande Canalization Project authorized by the Act of Congress approved June 4, 1936 (49 Stat. 1463),

NOW THEREFORE, it is agreed as follows:

For and in consideration of $179.20 paid and transferred by the Department of State from Department of State Appropriation Act, 1942- International Boundary Commission, United States and Mexico-Rio Grande Canalization Project, Chapter 258-Public No. 135, 77th Congress, 1st Session, approved June 28, 1941, to the Department of the Interior, to be covered into the Reclamation Fund, receipt of which is hereby acknowledged by the Secretary of the Interior, the control of and jurisdiction over the following described tract of land is hereby transferred, assigned, and quitclaimed to the Department of State to be used in connection with the Rio Grande canalization project:

Land Section
File No. 702-1/2

Checked as to Engineering Data:

A tract of land situate, lying and being in Dona Ana County, New Mexico and within the Mesilla Civil Colony Grant, Tract 1, being also within the northeast quarter of the northwest quarter (NE 1/4 NW 1/4) of Section 13, Township 24 South, Range 1 East, N.M.P.M., Bureau of Reclamation Survey and more particularly described as follows (All bearings being in relation to a true meridian established by the United States Section of the International Boundary Commission, United States and Mexico, at the bridge over the Rio Grande on the Mesquite Road, Dona Ana County, New Mexico):

Beginning at the most easterly corner of the tract herein described, being a point in the southwesterly line of the Bureau of Reclamation's East Side Canal, from which the quarter corner as established by the Bureau of Reclamation between Sections 12 and 13, said township and range, bears North 10° 29' East, two hundred seventy-four and forty-three hundredths (274.43) feet;

Thence South 43° 59' West, forty-eight and ninety hundredths (48.90) feet to an angle point on the south line of the Mesilla Dam Reservation;

Thence along said reservation line North 73° 20' West, two hundred twenty-five and thirty hundredths (225.30) feet to an angle point;

Thence continuing along said reservation line South 43° 59' West, one hundred seventy-three and twenty-one hundredths (173.21) feet to a point on a curve which is parallel to and sixty and ninety-eight hundredths (60.98) feet northeasterly of the center line of the East Levee of the Rio Grand Canalization Project;

Thence northwesterly, along a curve to the left of radius two thousand nine hundred twenty-five and seventy-seven hundredths (2925.77) feet a distance of two hundred thirty-two and ninety hundredths (232.90) feet (said curve being subtended by a chord bearing North 63° 27' 10" West, two hundred thirty-two and eighty-three hundredths (232.83) feet) to the end of said curve;

Thence North 65° 44' West, four hundred twenty-nine and forty hundredths (429.40) feet to the most westerly corner of the tract herein described;

Thence North 46° 52' East, one hundred fourteen and fifty-three hundredths (114.53) feet to the most northerly corner of the tract herein described and a point in the southwesterly line of the said East Side Canal;

Thence along said southwesterly line South 73° 26' East, nine hundred twenty-four and sixty-three hundredths (924.63) feet to the place of beginning and containing two and fifty-six hundredths (2.56) acres, more or less. Said described land is as shown on Drawing No. 5087-36K of the United States Section of the International Boundary Commission, United States and Mexico,

UNITED STATES

DEPARTMENT OF THE INTERIOR

BUREAU OF RECLAMATION

WASHINGTON

Office of the Commissioner December 19, 1941

MEMORANDUM for the Secretary.

On July 16 the Secretary of State requested a transfer of a small tract of land near the Mesilla Diversion Dam of the Rio Grande Reclamation project from the jurisdiction of the Department of the Interior, Bureau of Reclamation, to the Department of State for use in connection with the Rio Grande Canalization project.

A report from field officers of this Bureau shows:

(1) That the total area involved is 2.56 acres.

(2) That the land in question was purchased by the Bureau of Reclamation in connection with the Rio Grande Reclamation project with monies appropriated from the Reclamation fund.

(3) That the small area in question is no longer needed for Reclamation purposes.

(4) That the present reasonable market value of the land is $179.20.

In view of these facts the Secretary of State was advised by First Assistant Secretary Burlew's letter of November 22 that a transfer should be upon a consideration of $179.20 to be covered into the Reclamation fund.

On December 12 the Secretary of State advised that this consideration was satisfactory and submitted a proposed form of agreement. I have examined this memorandum of agreement and am satisfied as to its form and contents.

I recommend that you execute this agreement and deliver the same to the Secretary of State conditioned upon receipt of $179.20 to be covered into the Reclamation fund. A proposed letter of transmittal is attached.

/s/ John C. Page
Commissioner.

Enclosure 2837784.
CC-CE,Denver, Colo.
Supt., El Paso, Texas
DC, Amarillo, Texas

IN WITNESS WHEREOF, the Secretary of the Interior and the Secretary of State have hereunto subscribed their official signatures the day and year first above written.

Secretary of State.

Secretary of the Interior

RGP 092766

MEMORANDUM OF UNDERSTANDING
AND CONTRACT

AMONG THE

DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

DEPARTMENT OF STATE
INTERNATIONAL BOUNDARY AND WATER COMMISSION
UNITED STATES SECTION

AND

EL PASO COUNTY WATER IMPROVEMENT DISTRICT NO. 1

FOR THE RELOCATION OF A SEGMENT OF THE FRANKLIN CANAL OF THE RIO GRANDE PROJECT, TEXAS, AND FOR OPERATION AND MAINTENANCE OF THE COMPLETED SEGMENT.

THIS MEMORANDUM OF UNDERSTANDING entered into this 1st day of October, 1966, between the BUREAU OF RECLAMATION, DEPARTMENT OF THE INTERIOR, hereinafter referred to as the Bureau, represented by the Regional Director, Region 5, Amarillo, Texas, and the UNITED STATES SECTION, INTERNATIONAL BOUNDARY AND WATER COMMISSION, UNITED STATES AND MEXICO, hereinafter referred to as the Commission, represented by the United States Commissioner of said Commission; AND THIS CONTRACT, entered into as of the same date, between THE UNITED STATES OF AMERICA, represented by the said United States agencies and their undersigned officers, and the EL PASO COUNTY WATER IMPROVEMENT DISTRICT NO. 1, hereinafter referred to as the District, a quasi municipal organization duly organized and existing under the laws of the State of Texas; the Bureau acting herein pursuant to the Act of Congress approved June 17, 1902 (32 Stat. 388), and Acts amendatory thereof and supplementary thereto, and the Commission acting pursuant to the authority of the American-Mexican Chamizal Convention Act of 1964, approved April 29, 1964 (Public Law 88-300, 78 Stat. 184),

WITNESSETH THAT:

WHEREAS, the United States of America and the United Mexican States have entered into a convention dated August 29, 1963, for the solution of the problem of the Chamizal which related to the determination of national sovereignty of an area of land near El Paso, Texas, and Juarez, Chihuahua, and

WHEREAS, the Commission has been authorized by the Congress to perform all functions necessary to reestablish the territory of the Chamizal as prescribed in the Convention, and this includes the relocation of all facilities and properties necessitated by the basic project, and the Commission has determined that it is necessary to relocate a segment of the Franklin Canal, and

WHEREAS, the segment of the Franklin Canal to be relocated serves the El Paso Valley, Ysleta Branch, a unit of the Rio Grande Project, which is a Federal Reclamation Project operated by the Bureau under contract with the District, and the Bureau and the District are agreeable to relocating said segment under the terms of this memorandum and contract.

NOW, THEREFORE, the parties hereto do agree as follows:

1. The Commission shall at its cost and expense acquire acceptable canal right-of-way for and relocate a segment of the Franklin Canal in the Chamizal area at the location shown on the plans and in conformance with the plans and specifications attached hereto, designated as Exhibit A and by this reference made a part hereof. References to Franklin Canal shall include all related facilities, appurtenances, crossings or other improvements as the same are indicated on the attached exhibits.

2. Action shall be taken by the Bureau to insure that the Secretary of the Interior or other duly authorized official of the United States shall notify the City of El Paso that the existing segment of the Franklin Canal, when relocated, is no longer needed for the operation of said canal or for irrigation purposes, and that on receipt of such notification, whatever rights or title the City had by the conveyance to the United States as to such part of the Franklin Canal shall thereupon revert to the City.

3. The relocated segment of the Franklin Canal, together with its transitions, turnouts, and other related irrigation structures, shall be under the jurisdiction of the Bureau and become a part of the Rio Grande Federal Reclamation Project, and shall be operated and maintained thereafter by the Bureau or the District in the manner agreed upon by the Bureau and the District; provided, however, that all crossings (including but not limited to streets, alleys, roads, bridges, sewers, water mains, gas pipe lines, electric power and telephone lines, cables, conduits, railways, and other utilities) provided for in the design of the relocated Franklin Canal shall be constructed without cost or charge to the Bureau or the District, and shall be operated and maintained by and at the expense of the owners of such crossing facilities, or the party or parties having the lawful right to use and operate the same. The Commission shall have the responsibility of making necessary arrangements with parties desiring to cross the relocated segment of the Canal with any structure, appliance, equipment or apparatus of any kind and shall have authority to grant easements and rights of way for such crossing facilities, but no permit, right or easement shall be granted that will in any way interfere with, impede or obstruct the full use of said relocated segment for the irrigation of lands within the District.

3A. Jurisdiction to the lands described on attached Exhibit B and shown in red on the typical cross section attached as Exhibit C, heretofore acquired for extension of the American Canal to the Riverside Heading, which jurisdiction is now held by the Commission, shall be transferred, conveyed, and assigned to the Bureau, subject to the Bureau assuming responsibility for the maintenance of the area transferred, and to reservation by the Commission of access to and from its Rectification Project at Riverside Drive and Ysleta-Zaragosa Road, the Bureau to provide at its expense the means therefor. The transfer will also be subject to regulations of the General Services Administration.

4. With reference to the abandoned canal segment area, the Commission will, at its expense, backfill and rough grade it to that of the adjoining natural ground surface; that is, to approximately the same condition as it was prior to its use as a canal.

5. The Commission, in performing the relocation of the Franklin Canal to serve the Rio Grande Federal Reclamation Project, shall perform such work and provide such temporary works as may be necessary, in accordance with plans approved in advance by the Bureau, to assure that there will be no interference with service to the lands of the project.

6. The Bureau and the District shall not be responsible for injury or damage to any person or property in connection with the construction of the relocated Franklin Canal.

7. Any notice or communication authorized or required by this memorandum shall be deemed properly given, upon proper delivery to the Project Superintendent, Bureau of Reclamation, Rio Grande Project Office, El Paso, Texas, on behalf of the Bureau, and to the Commissioner, United States Section, International Boundary and Water Commission, El Paso, Texas, on behalf of the Commission, and to the General Manager, El Paso County Water Improvement District No. 1, El Paso, Texas, on behalf of the District. The designation of the person to be notified, or the address of such person, may be changed at any time by similar notice.

8. Changes in the design for relocation during construction will be subject to the advance written approval of the Bureau.

9. The Bureau shall have the right to inspect the work at any time during its progress and to make final inspection upon completion of all work. District shall have the right to inspect all work upon completion.

10. Where the operations of this contract extend beyond the current fiscal year, the District understands that the contract is made contingent upon Congress making the necessary appropriation for expenditures thereunder after such current fiscal year has expired. In

case such appropriation as may be necessary to carry out this contract is not made, District hereby releases the United States from all liability due to the failure of Congress to make such appropriation.

11. The District warrants that no person or agency has been employed or retained to solicit or secure this memorandum and contract upon an agreement or understanding for a commission, percentage, brokerage, or contingent fee, excepting bona fide employees or bona fide established commercial agencies maintained by the District for the purpose of securing business. For breach or violation of this warranty, the Commission shall have the right to annul this memorandum and contract without liability, or, in its discretion, to require the District to pay, in addition to the contract consideration, the full amount of such commission, percentage, brokerage, or contingent fee.

12 No Member of or Delegate to Congress, or Resident Commissioner, shall be admitted to any share or part of this contract or to any benefit that may arise herefrom, but this restriction shall not be construed to extend to this contract if made with a corporation or company for its general benefit.

13. This memorandum and contract shall inure to the benefit of and be binding upon the successors and assigns of the parties hereto.

IN WITNESS WHEREOF, the parties hereto have caused this instrument to be executed as of the day and year first hereinabove written.

BUREAU OF RECLAMATION

By /s/ Leon W. Hill
Regional Director

UNITED STATES SECTION, INTERNATIONAL BOUNDARY AND WATER COMMISSION

By /s/ J. F. Friedkin
United States Commissioner

EL PASO COUNTY WATER IMPROVEMENT DISTRICT NO. 1

By /s/ J.S. Samples
President

ATTEST:

/s/ Louise E. Seymour
Secretary

(SEAL)

CONFORMED COPY

Contract No. 14-06-500-1229

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

RIO GRANDE PROJECT
TEXAS - NEW MEXICO

# MEMORANDUM OF UNDERSTANDING
BETWEEN
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
AND
DEPARTMENT OF STATE
INTERNATIONAL BOUNDARY AND WATER COMMISSION

RELATING TO THE RELOCATION OF A SEGMENT OF THE FRANKLIN CANAL OF THE RIO GRANDE PROJECT AS A PART OF THE CHAMIZAL SETTLEMENT IN FURTHERANCE OF THE AMERICAN-MEXICAN CHAMIZAL CONVENTION ACT OF 1964

Contract No. 14-06-500-1229

MEMORANDUM OF UNDERSTANDING
BETWEEN
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
AND
DEPARTMENT OF STATE
INTERNATIONAL BOUNDARY AND WATER COMMISSION

RELATING TO THE RELOCATION OF A SEGMENT OF THE FRANKLIN CANAL OF THE RIO GRANDE PROJECT AS A PART OF THE CHAMIZAL SETTLEMENT IN FURTHERANCE OF THE AMERICAN-MEXICAN CHAMIZAL CONVENTION ACT OF 1964

THIS MEMORANDUM OF UNDERSTANDING entered into this 3rd day of JANUARY, 19 66, between the BUREAU OF RECLAMATION, DEPARTMENT OF THE INTERIOR, acting pursuant to the Act of Congress approved June 17, 1902 (32 Stat. 388), and acts amendatory thereof and supplementary thereto, represented by the Regional Director, Region 5, Amarillo, Texas, and the UNITED STATES SECTION, INTERNATIONAL BOUNDARY AND WATER COMMISSION, DEPARTMENT OF STATE, acting pursuant to the authority of Public Law 88-300, approved April 29, 1964, represented by the officer executing this Memorandum on behalf of the Secretary of State, his duty appointed successor, or his duly authorized representative.

WITNESSETH THAT:

WHEREAS, the Secretary of State, acting through the United States Commissioner, International Boundary and Water Commission, herein identified as the Commission, is authorized to acquire the necessary lands for relocation of publicly owned facilities and to relocate such facilities when in the judgment of the Commission such relocation is necessitated by the Chamizal Treaty; and

WHEREAS, the Bureau of Reclamation, herein referred to as the Bureau, is willing to undertake a portion of the work required for relocation of a segment of the Franklin Canal.

NOW, THEREFORE, the parties hereto agree as follows:

WORK TO BE PERFORMED BY BUREAU

1. (a) The Bureau will prepare designs, specifications, and engineering estimates for the relocation of a segment of the Franklin Canal in El Paso, Texas, from Leon Street Wasteway to a

point near Second Street, and for grading and leveling the area containing the abandoned segment of the canal. The Bureau will furnish to the Commission three copies of a draft of specifications for inclusion as an independent schedule of a contract to be administered by the Commission. The parties recognize that it is desired to have the draft of specifications ready by May 1, 1966, and the Bureau will exercise diligent effort, including the use of overtime, as appropriate, to deliver the draft in advance of that date. It is further recognized that timely completion of the draft is subject to timely receipt of field data as hereinafter provided in Article 2. After review by the Commission, the specifications will be printed in final form by the Bureau.

(b) As soon as possible after the execution of this Memorandum, the Bureau will prepare a preliminary estimate of the cost of the relocation. This estimate will be in proper form for use as a basis for programing the work. The estimate will be current for a design discharge of 1,200 c.f.s., and in keeping with the overall plan for river channel relocation and associated facilities now being finalized. The cost of work to be performed by the Bureau under the terms of this Memorandum will be included as a separate item in the preliminary estimate of cost.

(c) Within ten (10) days after the execution of this Memorandum, the Bureau will prepare a statement of design data requirements. This statement will set forth fully the requirements for field data and dates needed for completion of designs and specifications and will be for the purpose of enabling the Commission to obtain the data described in Article 2.

(d) As technical advisers to the Commission, the Bureau will perform engineering examinations of the work. Administration, supervision and inspection of the relocation contract will be the responsibility of the Commission as hereinafter provided in Article 2.

(e) Assistance in soil investigations, classification and testing will be provided by the Bureau, if needed, upon request by the Commission. The cost of such special assistance will be in addition to the cost to be included in the preliminary estimate to be prepared by the Bureau under (b) above.

(f) The Bureau will make all changes in the design drawing required during construction, upon request by the Commission, resulting from changed conditions including but not limited to: changes in adjacent facilities, changes in design requirements, and changes required to meet unforeseen field conditions.

WORK TO BE PERFORMED BY THE COMMISSION

2. (a) The Commission will collect and submit all field data required by the Bureau for completion of designs and specifications. Such data will include soil and foundation investigations and

field surveys of final canal alignment. The Commission will inform the Bureau of all proposed changes in the design data and will transmit the changes as soon as practicable thereafter.

(b) The Commission will issue specifications, award contracts, perform all contract administration, and supervise all construction surveys, construction inspection, and testing of construction materials in accordance with standards and requirements set forth in the specifications.

(c) The Commission will furnish to the Bureau two sets of marked prints as soon as practicable after completion of the construction work showing all minor changes, if any, to the design drawings resulting from field changes not previously referred to the Bureau under Article 1, Section (f).

(d) The Commission will obtain the right-of-way required for the river channel relocation and associated facilities and will specify the location of the portion of this right-of-way to be reserved for the Franklin Canal Relocation for the purpose of defining the limits of the contract work to be performed under the Bureau specifications and for the purpose of defining the limits of the canal right-of-way as related to operation and maintenance of the completed canal and structures. The Commission will clear the right-of-way of existing structures. The Commission will furnish to the Bureau a description and the location of any existing structures, including foundations and utilities, not expected to be cleared from the canal right-of-way prior to commencement of construction and for which removal will be required under the canal specifications.

(e) The Commission will make all necessary agreements with owners of utilities, streets and bridges on which work will be required under the contract and for which the Bureau may be required to perform design work. Bridges, conduits or culverts to be used under railroads, highway, street or road, and structures required in connection with alteration of sewers and other public utilities shall conform with the standards, design criteria and requirements of the respective owners.

## DESIGN CRITERIA

3. The canal relocation will be designed to current Bureau standards. Its design capacity will be such that as a part of future works that may be constructed, it will carry 1,200 c.f.s. Structures and facilities will be provided to adequately operate the canal in its new location. Advance plans for modification of Leon Street Wasteway, the turnout and wasteway at Second Street, the Hill Street storm sewer and other utilities crossings, the culvert or conduit under a proposed service crossing near Eighth and Leon Streets, and railroad culverts in the vicinity of Santa Fe Street and Oregon Street, will be submitted to

the Commission for review and approval prior to completion of final design, together with explanations of their design and function. All such submissions shall be in triplicate. Statements will also be furnished in clear justification of the need of any structures performing other than present functions, for approval by the Commission.

NOTICES

4. Any notice or communication authorized or required by this Memorandum shall be deemed properly given, upon proper delivery to the Project Manager, Bureau of Reclamation, Rio Grande Project Office, El Paso, Texas, on behalf of the Bureau, and to the Commissioner, United States Section, International Boundary and Water Commission, El Paso, Texas, on behalf of the Commission. The designation of the person to be notified, or the address of such person, may be changed at any time by similar notice.

COMMISSION TO REIMBURSE BUREAU

5. The Commission will reimburse the Bureau for all expenses incurred in performing the work assigned for performance by the Bureau in this Memorandum. Such expense shall include but not be limited to, the following: (1) Preparation of preliminary cost estimates; (2) Preparation of designs and specifications; (3) Preparation of statement on design data requirement; (4) Examination of construction activites; (5) Assistance in soil investigations as requested; (6) Travel and other personnel or general expense, including overhead properly assigned to the work; and (7) Other services performed as specifically requested. Upon receipt of an itemized statement of expenditures on Standard Form 1081, to be submitted not more frequently than monthly, the Commission will reimburse the Bureau for expenses incurred but not previously reimbursed. It is intended that the preliminary cost estimate to be furnished by the Bureau will include all expenses estimated to be incurred by the Bureau exclusive of any special services which may be specifically requested by the Commission, but payment to the Bureau for the various work assignments described in this Memorandum shall not be limited to that amount. The Bureau shall diligently strive to perform all obligations assumed in the most economical and efficient manner, and the Commission will fully reimburse Bureau by transferring funds to the Regional Director, Bureau of Reclamation, Attention: 5-360, P. O. Box 1609, Amarillo, Texas 79105.

IN WITNESS WHEREOF, the parties hereto have caused this instrument to be executed as of the day and year first hereinabove written.

BUREAU OF RECLAMATION

By /s/ John C. Thompson
Acting Regional Director

UNITED STATES SECTION, INTERNATIONAL BOUNDARY AND WATER COMMISSION

By /s/ [illegible]

INVITATION

DEPARTMENT OF STATE
INTERNATIONAL BOUNDARY AND WATER COMMISSION
UNITED STATES AND MEXICO
UNITED STATES SECTION

# CHAMIZAL CONVENTION PROJECTS

## TECHNICAL SPECIFICATIONS
## AND
## DRAWINGS

## SCHEDULE I OF III

## FRANKLIN CANAL RELOCATION

PREPARED FOR
THE UNITED STATES SECTION
INTERNATIONAL BOUNDARY AND WATER COMMISSION
BY
UNITED STATES DEPARTMENT OF INTERIOR
BUREAU OF RECLAMATION
DENVER, COLORADO

BIDS WILL BE OPENED AT THE OFFICE OF THE INTERNATIONAL BOUNDARY AND WATER COMMISSION, 8th FLOOR, SOUTHWEST CENTER, EL PASO, TEXAS AT 10:30 A.M. MOUNTAIN STANDARD TIME, Oct. 27, 1966

E+ T.

SCHEDULE NO. I

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SECTION 6 - DRAWINGS


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PREFACE

Schedule No. I

FRANKLIN CANAL RELOCATION

Chamizal Convention Projects

The work to be performed under these specifications is composed of earthwork for and concrete lining of approximately 1.7 miles of canal; earthwork for and construction of concrete structures along the canal including two railroad culverts, a rectangular flume, and a turnout at Second Street; and the lowering of two storm sewers to pass under the relocated canal.

The section of the concrete canal lining will be trapezoidal having a bottom width of 10 feet, a height of 10 feet, a thickness of 3 inches, and with side slopes of 1 and 1/2:1.

FRANKLIN CANAL RELOCATION

CHAMIZAL CONVENTION PROJECTS

Bids will be considered on the following schedule combined with Schedules No. II and III, but no bid will be considered for only a part of a schedule. Award will be made in a single contract on the lowest combined bid for Schedules No. I, II, and III.

SCHEDULE NO. I

| Item No. | Work or material | Quantity and unit | Unit price | Amount |
|---|---|---|---|---|
| I-1 | Clearing and grubbing | For the lump | sum of | $_____ |
| I-2 | Canal embankment | 78,700 cu yd | $_____ | _____ |
| I-3 | Excavation for structures | 20,500 cu yd | _____ | _____ |
| I-4 | Backfill about structures | 15,600 cu yd | _____ | _____ |
| I-5 | Compacting backfill about structures | 15,600 cu yd | _____ | _____ |
| I-6 | Trimming earth foundations for concrete lining | 40,130 sq yd | _____ | _____ |
| I-7 | Refill at top of concrete lining | 3,500 cu yd | _____ | _____ |
| I-8 | Concrete in canal lining | 3,340 cu yd | _____ | _____ |
| I-9 | Concrete in structures | 4,615 cu yd | _____ | _____ |
| I-10 | Furnishing and handling cement | 11,935 barrels | _____ | _____ |
| I-11 | Furnishing and placing reinforcement bars | 588,000 pounds | _____ | _____ |

SCHEDULE NO. I - Continued

| Item No. | Work or material | Quantity and unit | Unit price | Amount |
|---|---|---|---|---|
| I-12 | Furnishing and installing rungs for safety ladders in canal lining | 208 rungs | $_____ | $_____ |
| I-13 | Furnishing and placing sponge rubber joint filler | 4,530 sq ft | _____ | _____ |
| I-14 | Furnishing and placing 9-inch, Type A, rubber waterstop | 2,870 lin ft | _____ | _____ |
| | Furnishing and laying the following sizes and classes of concrete pressure pipe: | | | |
| I-15 | Symbol 48D25 | 76 lin ft | _____ | _____ |
| I-16 | Symbol 54D25 | 76 lin ft | _____ | _____ |
| | Removal of the following sizes of reinforced concrete pipe: | | | |
| I-17 | 48-inch-diameter | 76 lin ft | _____ | _____ |
| I-18 | 54-inch-diameter | 76 lin ft | _____ | _____ |

# SECTION 1 - EARTHWORK

## 1.01. CLEARING AND GRUBBING

a. Clearing. - That portion of the right-of-way where required for access to and for constructing the work under these specifications shall be cleared of all trees, brush, rubbish, and other objectionable matter. Such cleared materials shall become the property of the contractor and shall be burned or removed from the site of the work before the date of completion of the contract, or otherwise disposed of as approved by the contracting officer.

As part of the work of clearing and grubbing the contractor shall remove existing slabs, walls, building foundations, and abandoned utilities encountered within the limits of the canal construction. Such slabs, walls, building foundations, and abandoned utilities shall become the property of the contractor and he shall remove them from the site of the work: Provided, That broken concrete and rubble masonry may be deposited in railroad embankments as prescribed in Schedule No. II, and as approved by the contracting officer.

b. Grubbing. - The ground surface under all embankments of normal dimensions, as shown on the drawings, and the surface of all excavation that is to be used for embankments shall be cleared of all stumps, roots, and vegetable matter of every kind. The stumps shall be pulled or otherwise removed, the roots shall be grubbed, and the stumps and roots shall be burned with other combustible material removed.

c. Payment. - Payment for clearing and grubbing will be made at the lump-sum price bid therefor in the schedule, which price shall include the cost of all work incident thereto.

Payment for clearing and grubbing borrow areas will be made as provided in Schedule No. II.

## 1.02. EXCAVATION FOR CANAL

a. General. - The canal sections are shown on the drawings, but the undetermined stability or porosity of the material in which these sections will be constructed and which will form the canal banks, or other factors, may make it necessary or desirable during the progress of the work to vary the slopes of excavations or the slopes of embankments and the dimensions dependent thereon.

No additional allowance will be made on account of any of the material being wet. Bidders and the contractor must assume all responsibility for deductions and conclusions as to the nature of the materials to be excavated and the difficulties of making and maintaining the required excavations.

the contracting officer, to prevent the accumulation of standing water, borrow pits shall be drained by means of open ditches.

b. Costs. - No direct payment will be made for excavation from borrow and the costs thereof shall be included in the unit price bid in the schedule for canal embankment.

## 1.04. PREPARATION OF SURFACES UNDER EMBANKMENTS

The entire ground surface under all canal embankments shall be scarified or plowed thoroughly to a depth of not less than 6 inches.

Where the ground surface under the embankment is not suitable, as determined by the contracting officer, for a foundation for the embankment, the contractor shall strip the area under the embankment of such unsuitable material to such depth as may be directed. The material so removed shall be disposed of as provided in Paragraph 1.10 (Disposal of Excavated Materials).

The cost of all work described in this paragraph shall be included in the unit price bid in the schedule for canal embankment.

## 1.05. CONSTRUCTION OF EMBANKMENTS

a. General. - All embankments shall be compacted. Embankments shall be constructed to top widths and side slopes as shown on the drawings; and where directed to provide an allowance for settlement, the embankment shall be built to heights as directed above those shown on the drawings. The top of embankments shall be graded to a uniform surface. All materials shall be deposited in embankments so that cobbles, gravel, and boulders will be well-distributed through the other materials and not nested in any position within or under the embankment.

Where the original ground surface is below the grade of the canal and where construction of a fill below the bottom of the canal is prescribed, such fill shall be placed as embankment. Where the original ground surface is below the base of a structure, the fill required to form a suitable foundation for the structure shall be placed as embankment.

Finer portions of the material excavated shall be placed in that part of the embankment nearest the water, and the coarser materials shall be placed in outer part of the embankment.

b. Compacting embankments. - The materials used for the compacted embankments shall be suitable materials, as determined by the contracting officer, and shall be obtained from required excavation or from designated borrow pits. Before the material for the first layer of the embankment is placed, the foundation for the embankment shall be prepared as provided in Paragraph 1.04 (Preparation of Surfaces under Embankments) and shall be moistened and compacted in the manner hereinafter specified for each layer of compacted embankment to be placed thereon. The embankments shall be compacted to the elevation and to the top widths and

or other practicable reasons in connection with individual structures the Government reserves the right to require the contractor to excavate to the prescribed pay lines. No payment will be made for excavation or removal of material which is outside of the prescribed pay lines unless such excavation or removal is directed by the contracting officer.

Measurement of excavation will be in accordance with the following:

(1) Rectangular flume, and railroad culverts. - Measurement of excavation for structures will include all required excavation for the structure below the original ground surface and between vertical planes at the upstream and downstream ends of the structure. Such measurement will also include any excavation for the structure upstream and downstream of these vertical planes which may be required below the original ground surface and outside of the excavation lines for the canal. Measurement of excavation upstream and downstream of the vertical planes and measurement between the vertical planes will be made to dimensions 1 foot outside of the foundations of the structures and to slopes of 1:1.

(2) Second street turnout. - Excavation for structures will include only the required excavation outside of the excavation lines for the canal and below the original ground surface, measured to the dimensions and slopes specified below. Measurement of excavation for structures will be made to dimensions 1 foot outside of the outline of the structure foundations and to slopes of 1:1.

(3) Precast concrete pipe for storm sewer modifications. - Excavation of the trench for the pipe will include all excavation for the pipe below the original ground surface within the excavation pay lines shown on the drawing, or prescribed by the contracting officer, measured to a bottom width equal to the overall distance between the outsides of the pipe along the horizontal diameters plus 1 foot and to slopes of 1:1. Where backfill above the bottom of precast concrete pipe is to be compacted by tamping, rolling, or surface vibrating methods, the bottom of the trench shall be shaped as shown on the drawing to cradle the pipe on undisturbed earth or compacted backfill. Regardless of whether the bottom of the trench is shaped to form a cradle or excavated to the bottom of the pipe, measurement, for payment, of excavation will be made to the bottom of the pipe. Where unsuitable material is encountered in the bottom of the trench for the pipe portions of the structures, the bottom of the trench shall be excavated, and measurement for payment will be made, to a depth as prescribed to provide for placing selected bedding material under the pipe.

(4) Transitions and cutoff walls. - Where the character of the material is such that it can be cut and trimmed to the required lines of the concrete structure and the concrete placed

## 1.07. BACKFILL ABOUT STRUCTURES

a. General. - Backfill about structures shall be placed to the lines shown on the drawings, as prescribed in this paragraph, or as directed. The type of material used for backfill, the amount thereof, and the manner of depositing the material shall be subject to approval. Insofar as practicable, backfill material shall be obtained from material moved in excavating for structures but when sufficient suitable material is not available from this source or from adjacent canal excavation, additional material shall be obtained from approved borrow pits.

b. Structures on fill. - Where the original ground surface is below the base of a structure or below the bottom of a pipe, all fill required for the structure foundation shall be placed as embankment. Except as provided in Subparagraph 1.08a. (Compacting Backfill about Structures) for sloping concrete walls or slabs, all fill about the structure above the base of the structure to lateral dimensions 1 foot outside the base of the structure and within slopes of 1:1 to the finished surfaces of adjacent earthwork shall be placed as backfill, except as otherwise shown on the drawings. All fill about the structures above the original ground surface and outside of the above-described backfill shall be placed as embankment.

c. Measurement and payment. - Excavation refill required to be placed about structures that is within the pay line limits for excavation for the structures will be measured in place for payment as backfill about structures. Except for structures described in Subparagraph b., fill about the structures above the original ground surface will be measured for payment to the lines shown on the drawings. Where the original ground surface is below the base of a structure, measurement, for payment, of backfill will be made above the structure base and within the lines prescribed in Subparagraph b. for backfill.

Measurement, for payment, of backfill about structures will be made only for the quantities actually placed within the limits of the established pay lines.

Payment for backfill about structures will be made at the unit price per cubic yard bid therefor in the schedule, which unit price shall include the cost of all work connected therewith, including the excavation and haul of the necessary material: Provided, That material from required excavation for structures used for backfill about structures will be paid for both as excavation when removed from original position and as backfill when placed. Where additional material is obtained from approved borrow pits and used for backfill about structures, payment will be made for the backfill only, and the costs of excavating and hauling of such material shall be included in the unit price bid in the schedule for backfill about structures: Provided, That if backfill material is not available within 1,000 feet from any point on the structure, additional haul will be ordered in accordance with Paragraph GC.10 of the General Conditions.

b. Compacting clayey and silty materials. - Where compaction of earth materials containing appreciable amounts of clay or silt is required, the materials shall be deposited in horizontal layers. The thickness of each horizontal layer after compaction shall be not more than two-thirds the length of the roller tamping feet or 6 inches whichever is the lesser. Where compaction is performed by hand or power tampers, the compacted layers shall not exceed 6 inches in thickness. The excavating and placing operations shall be such that the materials when compacted will be blended sufficiently to secure the highest practicable unit weight and best impermeability and stability. If the surface of any compacted layer of earthfill is too dry or smooth to bond properly with the layer of material to be placed thereon, it shall be moistened and/or scarified in an approved manner to provide a satisfactory bonding surface before the next succeeding layer is placed. All rollers used on any one layer of fill shall be of the same type and the same weight per foot of roller.

Prior to and during compaction operations, the material shall have a moisture content of not greater than 2 percent wet or less than 2 percent dry of optimum moisure, as determined by the contracting officer and the moisture content shall be uniform throughout each layer.

Insofar as practicable, as determined by the contracting officer, moistening of the material shall be performed at the site of excavation but such moistening shall be supplemented by sprinkling at the site of compaction, if necessary. If the moisture content is less than optimum for compaction by more than 2 percentage points or is greater than optimum for compaction by more than 2 percentage points, the compaction operations shall not proceed, except with the specific approval of the contracting officer, until the material has been wetted or allowed to dry out, as may be required, to obtain optimum moisture content within the tolerances permitted above, and no adjustment in price will be made on account of any operations of the contractor in wetting or drying the materials or on account of any delays occasioned thereby.

When the material has been conditioned as hereinbefore specified, it shall be compacted by tamping rollers or by hand or power tampers. Where hand or power tampers are used to compact soils in confined areas such as under pipe, they shall be equipped with suitably shaped heads to obtain the required density.

The density (dry) of the soil fraction in the compacted material shall not be less than 95 percent of the laboratory standard maximum soil density (dry) as determined by the Bureau of Reclamation Proctor Compaction Test for the materials being compacted.

(1) Compaction test. - The compaction tests will be made by the Government. The standard maximum soil density is the dry weight per cubic foot of the soil compacted at optimum moisture content by laboratory procedure. The compaction test is the same as ASTM Designation: D 698, Method A, except that a 1/20-cubic-foot compaction mold is used and the rammer is dropped from a height of 18 inches.

d. Rollers. - Rollers used for compacting earth materials described in Subparagraph b. above shall be tamping rollers meeting the following requirements. Each drum of a roller shall be not more than 6 feet in length. The roller shall have staggered and uniformly spaced tamping feet and be of sufficient weight for proper compaction. The end area of each tamping foot shall be not less than 5 square inches nor more than 10 square inches. The length of each tamping foot measured from the surface of the drum to the surface of the tamper head shall be not less than 7 inches. The distance measured on the surface of the drum between the center of any two adjacent tamping feet shall be not less than 8 inches. The total end area of the tamping feet shall not comprise more than 9 percent of the total cylindrical area based on the overall diameter and length of the roller at the outer ends of the tamping feet. The tamping heads and cleaner bars shall be properly maintained, and the spaces between the tamping feet shall be kept clear of materials which impair the effectiveness of the tamping roller.

e. Costs. - The cost of compacting earth materials as described in this paragraph shall be included in the unit prices bid in the schedule for compacted embankments and compacting backfill.

## 1.10. DISPOSAL OF EXCAVATED MATERIALS

All suitable materials removed in excavation or as much thereof as may be needed, shall be used in the construction of canal embankments, for the backfill about structures or deposited in railroad or bridge approach embankments under Schedule No. II or III as directed.

Material removed in excavation and not suitable for canal embankment construction or for backfill required under Schedule No. I shall be deposited in railroad embankments under Schedule No. II for blending with other materials.

The cost of all work described in this paragraph shall be included in the unit prices bid in the schedule for other items of work.

## 1.11. RIPRAP

a. General. - The contractor shall furnish and place riprap to the prescribed outlines and thicknesses as shown on the drawings for the protection of channels and structures, and elsewhere as required.

b. Material. - The rock shall be hard, dense, and durable. Either quarried rock or boulders may be used for riprap. The rock in riprap shall be reasonably well graded from the maximum size down to the minimum size as shown in the table.

## SECTION 2 - STRUCTURES

### 2.01 CONSTRUCTION OF STRUCTURES

The structures to be constructed will include:

a. Rectangular flume.
b. Railroad culverts.
c. Turnout.
d. Storm sewer modifications.

The structures will be located at various points along the canal, as shown on the drawings or as otherwise designated. The sequence of construction of the structures shall be subject to approval of the contracting officer. Where the thickness of any portion of a concrete structure is variable, it shall vary uniformly between the dimensions shown. The contractor shall place and attach to each structure, all timber, metal, or other accessories necessary for its completion, as shown on the drawings. The cost of such work, for which specific unit prices are not provided in the schedule, shall be included in the prices bid in the schedule for the work to which it is appurtenant.

The structures shall be built to the lines, grades, and dimensions shown on the drawings. The dimensions of each structure as shown on the drawings will be subject to such modifications as may be found necessary by the contracting officer to adapt the structure to the conditions disclosed by the excavation or to meet other conditions.

Where necessary, as determined by the contracting officer, the contractor will be furnished additional detail drawings of the structures to be constructed. The contractor shall be entitled to no additional allowance above the unit prices bid in the schedule by reason of the dimensions fixed by the contracting officer or by reasons of any modifications or extensions of a minor character to adapt the structures to the structure site, as determined by the contracting officer.

Concrete in structures shall conform to the requirements of Paragraphs 5.01 (Conposition) through 5.20 (Payment).

### 2.02 JOINTS IN CONCRETE

a. Construction joints. - Construction joints are joints which are either purposely placed in structures to facilitate construction or which occur in structures as a result of inadvertent delays in concrete placing operations. Construction joints are located to facilitate the contractor's operations, to reduce initial shrinkage stresses and cracks, to allow time for the installation of embedded metalwork, or to allow for the subsequent placing of other concrete. Bond is required at construction joints regardless of whether or not reinforcement is continuous across the joint.

Joints between adjoining portions of the filler material shall be sufficiently tight to prevent mortar from seeping through such joints. Unless otherwise shown on the drawings or directed, the edges of the sponge rubber filler shall be placed flush with the finished surface of the concrete or to the bottom edge of chamfers.

d. Measurement and payment. - Measurement, for payment, of sponge rubber joint filler will be made of the area of material in place. Payment for furnishing and placing sponge rubber joint filler will be made at the unit price per square foot bid therefor in the schedule.

2.04 RUBBER WATERSTOP

a. General. - Rubber waterstop shall be furnished and placed in the joints at the locations shown on the drawings or where directed. The contractor shall also furnish all labor and materials for making field splices in rubber waterstop.

Type "A," "B," "G," and "H" rubber waterstops shall be in accordance with the details shown on Drawing No. 13 (40-D-2867).

The contractor shall take suitable precautions to support and protect the waterstop during the progress of the work and shall repair or replace any damaged waterstop. All waterstops shall be protected from oil or grease.

b. Material. -

(1) Rubber waterstop. - The rubber waterstop shall be fabricated from a high-grade, tread-type compound. The basic polymer shall be natural rubber or a synthetic rubber. The material shall be compounded and cured to have the following physical characteristics:

(3) Marks resulting from the tubing operation or handling during manufacture with no limit to width or frequency of occurrence as long as the thickness of material below the mark is not less than the minimum thickness.

(4) Coarse or grainy surface texture.

(5) Suck-back along flash lines of molded goods if not more than 1/16 inch wide, 1/16 inch deep, and not more than 2 feet long.

The tolerances, shown on the drawing, shall govern all cross-sectional dimensions. Any defects which are not within the above limitations either shall be repaired as approved by the contracting officer or shall be removed from the finished product by cutting out a length of waterstop containing such defects and splicing the waterstop at that point. All factory splices shall be molded splices. Molded splices shall be made by vulcanizing the splices in a steel mold for a time sufficient to produce maximum strength in the splice. All molded splices shall withstand being bent 180° around a 2-inch-diameter pin without any separation at the splice.

Rubber waterstop for joints in the box portions of structures shall be furnished in continuous circular hoops. The hoops shall be fabricated from straight strip waterstop with the ends spliced together with molded splices to form a closed ring of the specified circumferential length. A tolerance of plus or minus 2 inches will be permitted in the circumferential length of each hoop.

d. Tests. -

(1) General. - Rubber waterstop shall be subject to laboratory tests before shipment. Material for tests shall be furnished by the manufacturer and all tests shall be made at the place of the manufacturer of the rubber waterstop.

Except as otherwise provided below, general sampling procedures shall be in accordance with Section 6 of Federal Test Method Standard No. 601.

(2) Sampling for tests. - Samples for laboratory tests to determine physical properties of the compound shall be taken at random to obtain the following number of test units from each separate purchase order:

| Size of purchase order | No. of test units |
|---|---|
| 500 lin ft or less | 1 |
| 501 to 1,000 lin ft | 2 |
| 1,001 to 5,000 lin ft | 4 |
| 5,001 to 10,000 lin ft | 8 |
| Over 10,000 lin ft | 15 |

At the option of the manufacturer, laboratory tests to determine physical properties of the rubber waterstop required to be furnished under these specifications shall be performed

at an angle of 45° or flatter by the use of a saw and miter box so that the ends to be spliced together will be pressed together when the mold is closed. The beveled ends and the sides for at least one-fourth of an inch back from the ends shall be buffed thoroughly to provide clean, rough surfaces. All buffed surfaces shall be given two thin coats of rubber cement and each coat shall be permitted to dry thoroughly. A piece of gum rubber cut to the same dimensions as the beveled face shall then be applied to the end of one strip after removing the cloth backing from the gum rubber. The adjoining strip shall then be placed accurately in position, and all edges shall be stitched thoroughly together with a suitable handstitcher The mold shall be heated to a temperature of 290° F before the splice is placed in the mold. The prepared splice shall be placed in the mold with the splice in the center of the mold, and the mold shall be closed tightly to prevent slipping during the vulcanizing process. The splice shall remain in the mold 25 minutes after the mold is closed completely, during which time the mold shall be maintained at a temperature of 290° F.

Each finished splice shall withstand a bend test by bending the waterstop 180° around a 2-inch-diameter pin without showing any separation at the splice.

The contractor shall furnish all materials for splices, all field splicing molds, and electrical energy for heating the molds.

g. Measurement and payment. - Measurement, for payment, of furnishing and placing rubber waterstop will be made of the number of linear feet of waterstop in place measured along the centerline of the waterstop.

Payment for furnishing and placing rubber waterstop will be made at the unit price per linear foot bid therefor in the schedule, which unit price shall include the cost of furnishing all material, making field splices and installing the waterstop.

## SECTION 3 - CONCRETE LINING

### 3.01 CONCRETE IN LINING

a. General. - Unreinforced concrete lining shall be constructed in the canal prism as shown on Drawing No. 4 (20303) (23-D-529).

Before placing of concrete in lining the earthwork shall be completed to subgrade and the earth foundations shall be trimmed as specified in Paragraph 3.03 (Trimming Earth Foundations for Concrete Lining). Concrete in lining shall conform to the requirements of Paragraphs 5.01 (Composition) to 5.20 (Payment), inclusive.

When concrete lining placing operations are stopped for the day, interrupted because of breakdown, or delayed by other causes, the end of the fresh concrete lining shall be bulkheaded to a vertical surface. When placing operations are resumed, the surface of the hardened concrete shall be prepared as a construction joint, as provided in Paragraph 2.02 (Joints in Concrete), and a groove shall be constructed in the new concrete for filling with mastic filler, as provided in Subparagraph b.

b. Grooves. - Grooves shall be constructed in concrete lining where and as shown on Drawing No. 4 (20303) (23-D-529). The grooves shall be made along straight lines, to the detailed dimensions shown, and shall be maintained to the required shape and dimensions during any subsequent finishing operations until the concrete has hardened.

Grooves in concrete lining shall be filled with mastic filler. The grooves shall be clean and free from foreign substance when the mastic filler is applied. Grooves shall not be filled while rain is falling or when there is free water in the grooves. To avoid unnecessary delay in application of concrete sealing compound, the grooves shall be filled prior to application of the sealing compound and as soon as the concrete has become sufficiently stiff to prevent appreciable distortion of the groove shape or damage to the concrete. The mastic filler shall be applied with a calking gun or other suitable applicator. Mastic filler that has stiffened to such an extent that it cannot be satisfactorily placed shall be wasted.

The mastic filler shall conform to Bureau of Reclamation "Specifications for Sealing Compound, Rubberized, Cold Application, Ready-mixed, for Joints in Concrete Canal Lining," dated May 1, 1963.

c. Measurement. - Measurement of concrete in canal lining will be made as provided in Paragraph 5.19 (Measurement of Concrete).

the surfaces of compacted embankment and compacted backfill, over which concrete lining is to be placed shall be finished accurately to the dimensions shown on the drawings. If at any point material has been excavated beyond the neatlines required to receive the concrete lining, the excess excavation shall be refilled in horizontal layers with selected material, moistened if required, and compacted in accordance with Paragraph 1.09 (Compacting Earth Materials): Provided, That where placing and compacting refill on a sloping foundation, the layers may be placed parallel to the surface of the foundation. If at any point the foundation material is disturbed or loosened during the excavation process or otherwise, it shall be moistened, if required, and thoroughly compacted by tamping, rolling, or other approved methods to form firm foundations upon which to place the concrete lining.

b. Measurement and payment. - Measurement, for payment, of trimming earth foundations for concrete lining will be made of the finished foundations of earth surfaces of the canal prism over which concrete lining is prescribed and actually finished as provided in this paragraph. Payment for trimming earth foundations for concrete lining will be made at the unit price per square yard bid therefor in the schedule, which price shall include the cost of all work described in this paragraph.

## 3.04 REFILL AT TOP OF CONCRETE LINING

The contractor shall place fill on the berms along the top of the concrete lining as shown on the drawings. The material used for the refill may be obtained from required excavation or borrow. The type of material used and the manner of depositing shall be subject to approval by the contracting officer. Compaction of the refill material will not be required, but the refill shall be finished uniformly and neatly to the lines shown on the drawings.

Payment for refill at top of concrete lining will be made at the unit price per cubic yard bid therefor in the schedule, which unit price shall include the costs of all work connected therewith including excavating and hauling of the necessary material.

# SECTION 4 - CONCRETE PIPE

## 4.01 CONCRETE PRESSURE PIPE

The contractor shall furnish and lay all precast-concrete pipe for sewer modifications including all materials for pipe bends and pipe joints. The class and size of the pipe to be used in each location is shown on the drawings or specified herein, and the specifications for the pipe shall establish the minimum requirements for the pipe to be used.

Concrete pipe shall be furnished and tested in accordance with the Tentative Specifications for Reinforced Concrete Low-Head Pressure Pipe, ASTM Designation: C 361-65T, except that Clauses 5.7.1 and 5.7.1.1 are deleted and the following substituted therefor:

"Joints. - The joint design shall be similar to those shown on Drawings No. 15 (40-D-5806), 16 (40-D-5807), 17 (40-D-5808), and 18 (40-D-5809), and so proportioned that the spigot and gasket will readily enter the bell of the pipe. The shape and dimensions of the joint shall be such as to provide the following minimum requirements:

a. The rubber gaskets shall be solid gaskets of circular cross section.

b. The gasket shall be confined in an annular space formed by shoulders on the bell and spigot or in a groove in the spigot of the pipe so that movement of the pipe or hydrostatic pressure cannot displace the gasket and when the joint is assembled the gasket shall be compressed to form a watertight seal.

c. The gasket space provided in the engaged joint calulated for maximum spigot diameter, minimum bell diameter, and minimum depth of groove shall not be less than the volume of the gasket.

d. In all Type R-3 joints and in Type R-4 joints where the volume of the gasket is less than 85 percent of the volume of the annular space in which the gasket is to be contained with the engaged joint in concentric position (area of groove plus area of space between bell and spigot, using average bell and spigot diameters and average depth of groove, calculated to width of groove at surface of spigot), the gasket shall not be stretched more than 20 percent of its original length when seated on the spigot, and the gasket shall be of such size that when the outer surface of the spigot and the inner surface of the bell or sleeve come into contact at some point in their periphery the deformation in the gasket shall not exceed 40 percent at the point of contact and at the diametrically opposite point across the pipe shall not be less than 15 percent of the stretched gasket diameter. In Type R-4 joints where the volume of the gasket is 85 percent or more of the volume of the annular space in which the gasket is to be contained

shell or otherwise damage the pipe. No pipe shall be loaded and hauled to the site of the work until the end of specified curing period. Any unit of pipe that, in the opinion of the contracting officer is damaged beyond repair by the contractor in hauling, handling, storing, or otherwise, shall be removed from the site of the work and replaced by and at the expense of the contractor with another unit reinforced to withstand the same or greater head and loading requirements. Repairs, when allowed, shall be made in accordance with Chapter VII of the Seventh Edition of the "Reclamation Concrete Manual." Pipe that has been repaired shall be subject to the applicable hydrostatic and/or load tests in accordance with these specifications and ASTM Designation: C 361-65T.

4.02 BENDS

a. General. - Changes in alinement and grade of a pipeline shall be made by one or more of the methods described herein. The methods selected for making bends shall be subject to the approval of the contracting officer. Bearing tests and hydrostatic test will not be required on fabricated bends.

(1) Pulling of the joints. - Pulling of joints or opening of the annular space on one side of the pipe, will be permitted where alinement and grades can be established on sufficiently large radius to allow such procedure. Rubber gasket joints may be pulled as permitted in Subparagraph 4.03b. (Laying Concrete Pipe).

(2) Beveling ends of pipe. - The ends of pipe units may be beveled or fabricated with bevel adapters to provide the required curvature in the completed line: Provided, That a 5° bevel will be the maximum bevel permitted.

(3) Fabricated mitered pipe bends. - Mitered pipe bends shall be fabricated by miter cutting straight pipe to one-half the required deflection and fitting and mortaring together to form the required deflection angle in accordance with the details shown on Drawing No. 23 (222-D-21534). Pipe used in fabrication of bends shall be of the same class and type of joints as pipe to be laid adjacent to the required bends. Reinforcement at bends shall be lapped or welded, as shown on the drawing. After reinforcement steel of the pipe has been joined together, the pipe shall be connected with formed concrete, pneumatically placed mortar, or hand-placed mortar, placed, after required suitable preparation of surfaces to which the new material is to be bonded, in accordance with the procedures of Chapter VII of the Seventh Edition of the Bureau of Reclamation Concrete Manual. If either hand-placed or pneumatically placed mortar is used, it shall be applied from outside the pipe against a suitable form across the inside of the space to be filled, making sure to obtain a well-consolidated and well-bonded filling, particularly on the underside. The mortar shall be mixed in the proportion of one part, by weight of cement to two parts, by weight of sand conforming with requirements of Subparagraph 4.03c. (Laying Concrete Pipe). After the

position of a length of pipe is required after it has been laid, it shall be removed and rejointed as for a new pipe. After all pipelaying and joining operations are completed, the inside of the pipe shall be cleaned and all debris removed.

b. Laying pipe with rubber gasket joints. - The pipe units shall be fitted together and the joints shall be drawn together so that the bells and spigots are as nearly fully engaged as shown on the drawings as practicable and as prescribed below. Care shall be exercised to secure true alinement. The rubber gaskets shall be fitted properly in place and lubricated as necessary, and the pipe units shall be fitted together in a manner to avoid twisting or otherwise displacing or damaging the gaskets.

Backfilling of the pipe trenches shall follow pipe laying operations as closely as practicable. The contractor shall schedule his work so that at no time will pipe remain in the trench more than 7 days before being covered with backfill. If pipelaying operations are interrupted for more than 24 hours, all pipe laid in the trench shall be backfilled as described above.

Where the concrete pipe is encased in concrete a rubber gasket joint shall be provided at or adjacent to the nearest face of such encasement and the distance between the pipe joint and the concrete face shall not exceed one-half the diameter of the pipe.

When pipe is laid on tangent, each joint shall be fitted together so that the end of the spigot of one pipe is as close to being in contact with the shoulder of the bell or collar of the adjacent pipe as practicable and so that the Distance A as shown on the drawings is not less than three-fourths inch. No inside joint opening wider than one-half inch will be accepted and where the openings are wider than three-eighths inch the inside joint opening shall be filled with mortar, trowelled smooth and flush with inside surfaces of the pipe and coated with a sealing compound.

When pipe is laid on long-radius curves, the Distance A as shown on the drawings shall not be less than one-fourth inch at any point in the circumference of the joint and the inside joint opening shall be filled with mortar if any part of the inside joint opening exceeds three-eighths inch in width.

c. Mortar and grout for pipe joints. - Mortar for pipe joints shall be mixed not richer than one part, by weight, of cement to one part, by weight, of clean well-graded sand, and not leaner than one part, by weight, of cement to two parts, by weight, of clean well-graded sand, and with just sufficient water to obtain the proper consistency. To improve workability of the mortar, the contractor may replace not more than 7 percent, by weight, of cement with hydrated lime, or may replace not more than 30 percent, by weight, of cement with an approved pozzolan, or may add an air-entraining agent in the mortar, or use any approved

The 48-inch sewer is owned and maintained by the city of El Paso.

The 54-inch sewer is owned and maintained by Texas State Highway Department.

## 4.06 REMOVAL OF CONCRETE PIPE

a. General. - Where the 48- and 54-inch-diameter storm sewerlines along Hills Street cross the relocated Franklin Canal, the contractor shall remove the existing pipe as provided in Paragraph 4.05 (Modification of Storm Sewers). The existing pipe is reinforced concrete pipe with mortared tongue-and-groove joints. The contractor shall remove the pipe carefully so as not to damage the pipe that will remain in place. The pipe shall be removed between the limits shown on the drawings or directed. Excavation required to remove the pipe shall be performed in accordance with Paragraph 1.06 (Excavation for Structures).

All removed pipe shall become the property of the contractor and he shall remove it from the site of the work.

b. Measurement and payment. - Measurement for payment for removal of reinforced concrete pipe will be made along the centerline of the pipe from end to end, and no allowance will be made for lap at joints.

Payment for removal of reinforced concrete pipe will be made at the applicable unit prices per linear foot bid therefor in the schedule. Payment for excavation required for removal of the pipe that is within the excavation pay line limits for laying the new pipe for the sewer modifications will be made as excavation for structures.

# SECTION 5 - CONCRETE

## 5.01 COMPOSITION

a. General. - Concrete shall be composed of cement, sand, coarse aggregate, water, and admixtures as specified, all well mixed and brought to the proper consistency.

b. Maximum size of aggregate. - The maximum size of coarse aggregate in concrete for any part of the work shall be the largest of the specified sizes, the use of which is practicable from the standpoint of satisfactory consolidation of the concrete by vibration.

c. Mix proportions. - The proportions in which the various ingredients are to be used for different parts of the work shall be as determined from time to time during the progress of the work and as tests are made of samples of the aggregates and the resulting concrete. The mix proportions and appropriate water-cement ratio will be determined on the basis of procuring concrete having suitable workability, density, impermeability, durability, and required strength, without the use of an excessive amount of cement.

The net water-cement ratio of the concrete (exclusive of water, absorbed by the aggregates) shall not exceed 0.47, by weight, for concrete in thin sections of structures which will be exposed to frequent alternations of freezing and thawing, such as the top 2 feet of walls, piers, and walls of structures in the range of fluctuating water levels or subject to spray. The net water-cement ratio shall not exceed 0.53, by weight, for other concrete in structures which will be exposed to freezing and thawing and for concrete in canal linings. The net water-cement ratio shall not exceed 0.60, by weight, for concrete in structures that will be covered with fill material or be continually submerged or otherwise protected from freezing and thawing.

Tests of the concrete will be made by the Government, and the mix proportions shall be adjusted whenever necessary for the purpose of securing the required economy, workability, density, impermeability, durability, or strength, and the contractor shall be entitled to no additional compensation because of such adjustments.

d. Consistency. - The amount of water used in the concrete shall be regulated as required to secure concrete of the proper consistency and to adjust for any variation in the moisture content or grading of the aggregates as they enter the mixer. Addition of water to compensate for stiffening of the concrete before placing will not be permitted. Uniformity in concrete consistency from batch to batch will be required.

The slump of the concrete, after the concrete has been deposited but before it has been consolidated, shall not exceed 2 inches for concrete in the tops of walls, piers, and in slabs that are horizontal or nearly horizontal, and 3 inches for concrete

be made on samples taken from the cement at the latest time, prior to shipment in cars or trucks, that the cement is still in possession of the cement company. Cement not meeting test requirements will be rejected. Rejected cement shall be replaced with acceptable cement and the contractor shall be entitled to no adjustments in price or completion time by reason of any delays occasioned thereby.

The contractor will be charged the cost of testing of all Government-tested cement which has been ordered in excess of the amount of cement used for the work under these specifications. The charges to be made for the cost of testing excess cement will be at the rate of 12 cents per barrel, which charge includes the Government overhead, and will be deducted from payments due the contractor.

c. Measurement and payment. - Measurement, for payment, of sacked cement will be on the basis of the number of sacks of cement used at the mixer. Measurement, for payment, of bulk cement will be on the basis of batch weights at the batching plant. Any cement, either bulk or sacked, used for grouting, finishing, or other miscellaneous work will be measured for payment in the most practicable manner. One barrel shall be considered as 4 sacks of sacked cement or 376 pounds of bulk cement.

Payment will be made for cement used in concrete placed within the pay lines for concrete; and for cement used in concrete placed outside the concrete pay lines, unless the requirement for such concrete is determined by the contracting officer to be the result of careless excavation, or excavation intentionally performed by the contractor to facilitate his operations: Provided, That measurement, for payment, of cement used in concrete placed outside of the neatlines for concrete in lining will be limited to the percentage specified in Subparagraph 3.01d. (Concrete in Lining). No direct payment will be made for cement used in precast concrete pipe, or cement used in mortar or grout for precast concrete pipe joints. No payment will be made for cement used as follows: cement used in wasted concrete, mortar, or grout; cement used in the replacement of damaged or defective concrete; cement used in extra concrete required as a result of careless excavation; and cement used in concrete placed by the contractor in excavation intentionally performed by the contractor to facilitate his operations.

Payment for furnishing and handling cement will be made at the unit price per barrel bid therefor in the schedule, which unit price shall include the cost of rail and truck transportation of the cement from the mill to the jobsite and the cost of storing the cement.

## 5.03 ADMIXTURES

a. Air-entraining agents. - An air-entraining agent shall be used in all concrete. The agent used shall conform to ASTM Designation: C 260, except that the limitation and test

Sand, as delivered to the batching plant, shall have a uniform and stable moisture content.

b. Quality. - The sand shall consist of clean, hard, dense, durable, uncoated rock fragments. The maximum percentages of deleterious substances in the sand, as delivered to the mixer, shall not exceed the following values:

| | Percent, by weight |
|---|---|
| Material passing No. 200 screen (Designation 16) ..... | 3 |
| Lightweight material (Designation 17) ..... | 2 |
| Clay lumps (Designation 13) ..... | 1 |
| Total of other deleterious substances (such as alkali, mica, coated grains, soft flaky particles, and loam) ..... | 2 |

The sum of the percentages of all deleterious substances shall not exceed 5 percent, by weight. Sand producing a color darker than the standard in the colorimetric test for organic impurities (Designation 14) may be rejected. Sand having a specific gravity (Designation 9, saturated surface-dry basis) of less than 2.60 may be rejected. The sand may be rejected if the portion retained on a No. 50 screen, when subjected to 5 cycles of the sodium-sulfate test for soundness (Designation 19), shows a weighted average loss of more than 8 percent, by weight. The designations in parentheses refer to methods of tests described in the Seventh Edition of the Bureau of Reclamation Concrete Manual.

c. Grading. - The sand as batched shall be well graded, and when tested by means of standard screens (Designation 4), shall conform to the following limits:

Any royalties or other charges required to be paid for materials taken from deposits not owned by the Government and controlled by the Bureau of Reclamation shall be paid by the contractor.

Coarse aggregate, as delivered to the batching plant, shall have a uniform and stable moisture content.

b. Quality. - The coarse aggregate shall consist of clean, hard, dense, durable, uncoated rock fragments. The percentages of deleterious substances in any size of coarse aggregate, as delivered to the mixer, shall not exceed the following values:

| | Percent, by weight |
|---|---|
| Material passing No. 200 screen (Designation 16)..... | 1/2 |
| Lightweight material (Designation 18)..... | 2 |
| Clay lumps (Designation 13)..... | 1/2 |
| Other deleterious substances..... | 1 |

The sum of the percentages of all deleterious substances in any size, as delivered to the mixer, shall not exceed 3 percent, by weight. Coarse aggregate may be rejected if it fails to meet the following test requirements:

(1) Los Angeles rattler test (Designation 21). - If the loss, using Grading A, exceeds 10 percent, by weight, at 100 revolutions or 40 percent, by weight, at 500 revolutions.

(2) Sodium-sulfate test for soundness (Designation (19). If the weighted average loss after 5 cycles, is more than 10 percent, by weight.

(3) Specific gravity (Designation (10). - If the specific gravity (saturated surface-dry basis), is less than 2.60.

The designations in parentheses refer to methods of test described in the Seventh Edition of the Bureau of Reclamation Concrete Manual.

c. Separation. - The coarse aggregate shall be separated into nominal sizes and shall be graded as follows:

| Designation of size | Nominal size range | Minimum percent retained on screens indicated |
|---|---|---|
| 3/4 inch | 3/16 to 3/4 inch | 50 percent on 3/8 inch |
| 1 and 1/2 inches | 3/4 to 1 and 1/2 inches | 25 percent on 1 and 1/4 inches |

5.07 BATCHING

a. General. - The contractor shall provide equipment and shall maintain and operate the equipment as required to accurately determine and control the amount of each separate ingredient entering the concrete. The amounts of bulk cement, sand, and each size of coarse aggregate entering each batch of concrete shall be determined by weighing, and the amount of water shall be determined by weighing or by volumetric measurement. Where sacked cement is used, the concrete shall be proportioned on the basis of integral sacks of cement unless the cement is weighed.

When bulk cement and aggregates are hauled from a central batching plant to the mixers, the cement for each batch shall either be placed in an individual compartment which, during transit will prevent the cement from intermingling with the aggregates and will prevent loss of cement, or be completely enfolded in and covered by the aggregates by loading the cement and aggregates for each batch simultaneously into the batch compartment. The bins of batch trucks shall be provided with suitable covers to protect the materials therein from wind or wet weather. Each batch compartment shall be of sufficient capacity to prevent loss in transit and to prevent spilling and intermingling of batches as compartments are being emptied. If the cement is enfolded in aggregates containing moisture, and delays occur between filling and emptying the compartments the contractor shall, at his own expense, add extra cement to each batch in accordance with the following schedule:

| *Hours of contact between cement and wet aggregate | Additional cement required |
|---|---|
| 0 to 2 | 0 percent |
| 2 to 3 | 5 percent |
| 3 to 4 | 10 percent |
| 4 to 5 | 15 percent |
| 5 to 6 | 20 percent |
| Over 6 | Batch will be rejected. |

*The Government reserves the right to require the addition of cement for shorter periods of contact during periods of hot weather and the contractor shall be entitled to no additional compensation by reason of the shortened period of contact.

b. Equipment. - The weighing equipment shall conform to the applicable requirements of Federal Specification AAA-S-121b for such equipment, except that accuracy to within 0.4 percent over the entire range of the equipment will be required,

5.08 MIXING

a. General. - The concrete mixers shall be designed and operated so that the concrete, as discharged from the mixer, shall be uniform in composition and consistency throughout the mixed batch, and from batch to batch, except where changes in composition or consistency are required. The adequacy of mixing shall be determined by the Government by mixer performance tests in accordance with Designation 26 of the Seventh Edition of the Bureau of Reclamation Concrete Manual. Mixers, when tested, shall meet the following criteria:

(1) The unit weight of air-free mortar in samples taken from the first and last portions of the batch as discharged from the mixer shall not vary more than plus or minus 0.8 percent from the average of the two mortar weights, and the variation in unit weight of any six consecutive tests shall not exceed plus or minus 0.5 percent of the average of these tests.

(2) The weight of coarse aggregate per cubic foot in the samples taken from the first and last portions of the batch shall not vary more than plus or minus 5.0 percent from the average of the two weights of coarse aggregate.

The Government reserves the right to either reduce the size of batch to be mixed or to increase the mixing time when the charging and mixing operations fail to produce a concrete batch which conforms throughout to the above-numbered criteria and in which the ingredients are uniformly distributed and the consistency is uniform. Water shall be added prior to, during, and following the mixer-charging operations. Overmixing, requiring addition of water to preserve the required consistency, will not be permitted. Any concrete retained in mixers so long as to require additional water in excess of 3 percent of the design mix water (net water-cement ratio water, not including water absorbed by aggregates) to permit satisfactory placing shall be wasted. Any mixer that at any time produces unsatisfactory results shall be repaired promptly and effectively or shall be replaced.

b. Central mixers. - Mixers in centralized mixing plants shall be arranged so that mixing action in the mixers can be observed by the inspector and/or plant operator from a location convenient to the mixing plant operator's station. Mixers shall not be loaded in excess of their rated capacity unless specifically authorized. The concrete ingredients shall be mixed in a batch mixer for not less than the period of time hereinafter indicated for various mixer capacities after all of the ingredients except the full amount of water are in the mixer, except that the mixing time may be reduced if, as determined by the contracting officer, thorough mixing conforming to Subparagraphs a.(1) and (2) can be obtained in less time.

the size of batch mixed in that mixer may be reduced until, upon testing, a uniformly mixed batch, conforming to the mixer performance tests as provided in Subparagraph a., is obtained.

## 5.09 TEMPERATURE OF CONCRETE

The temperature of concrete when it is being placed shall be not more than 90° F, and not less than 40° F in moderate weather or not less than 50° F in weather during which the mean daily temperature drops below 40° F. Concrete ingredients shall not be heated to a temperature higher than that necessary to keep the temperature of the mixed concrete, as placed, from falling below the specified minimum temperature. Methods of heating concrete ingredients shall be subject to approval.

If concrete is placed when the weather is such that the temperature of the concrete would exceed 90° F, as determined by the contracting officer, the contractor shall employ effective means, such as precooling of aggregates and mixing water and placing at night, as necessary to maintain the temperature of the concrete, as it is placed, below 90° F. The contractor shall be entitled to no additional compensation on account of the foregoing requirements.

## 5.10 FORMS

a. General. - Forms shall be used, wherever necessary, to confine the concrete and shape it to the required lines. Forms shall have sufficient strength to withstand the pressure resulting from placement and vibration of the concrete, and shall be maintained rigidly in position. Forms shall be sufficiently tight to prevent loss of mortar from the concrete. Chamfer strips shall be placed in the corners of forms so as to produce beveled edges on permanently exposed concrete surfaces. Interior angles on such surfaces and edges at formed joints will not require beveling unless requirement for beveling is indicated on the drawings.

The cost of all labor and materials for forms and for any necessary treatment or coating of forms shall be included in the unit prices bid in the schedule for the concrete for which the forms are used.

b. Form sheathing and lining. - Wood sheathing or lining shall be of such kind and quality or shall be so treated or coated that there will be no chemical deterioration or discoloration of the formed concrete surfaces. The type and condition of form sheathing and lining, and the fabrication of forms for Finishes F2, F3, and F4 shall be such that the form surfaces will be even and uniform. The ability of forms to withstand distortion caused by placement and vibration of concrete shall be such that formed surfaces will conform with applicable requirements of these specifications pertaining to finish of

wood forms, form oil shall consist of straight, refined, pale, paraffin base mineral oil. For steel forms, form oil shall consist of refined mineral oil suitably compounded with one or more ingredients which are appropriate for the purpose. The contractor shall furnish certification of compliance with these specifications for form oil.

e. Removal of forms. - To facilitate satisfactory progress with the specified curing and enable earliest practicable repair of surface imperfections, forms shall be removed as soon as the concrete has hardened sufficiently to prevent damage by careful form removal. Forms on upper sloping faces of concrete, such as forms on the watersides of warped transitions, shall be removed as soon as the concrete has attained sufficient stiffness to prevent sagging. Any needed repairs or treatment required on such sloping surfaces shall be performed at once and be followed immediately by the specified curing.

Forms for siphons shall not be removed until the strength of the concrete is such that form removal will not result in perceptible cracking, spalling, or breaking of edges or surfaces, or other damage to the concrete. Forms shall be removed with care so as to avoid injury to the concrete and any concrete so damaged shall be repaired in accordance with Paragraph 5.13 (Concrete).

## 5.11 PREPARATIONS FOR PLACING

a. General. - No concrete shall be placed until all formwork, installation of parts to be embedded, and preparation of surfaces involved in the placing have been approved. No concrete shall be placed in water except with the written permission of the contracting officer, and the method of depositing the concrete shall be subject to his approval. Concrete shall not be placed in running water and shall not be subjected to the action of running water until after the concrete has hardened. All surfaces of forms and embedded materials that have become encrusted with dried mortar or grout from concrete previously placed shall be cleaned of all such mortar or grout before the surrounding or adjacent concrete is placed.

b. Foundation surfaces. - Immediately before placing concrete, all surfaces of foundations upon or against which the concrete is to be placed shall be free from standing water, mud, and debris. Earth foundations shall be free from frost or ice when concrete is placed upon or against them. The surfaces of absorptive foundations against which concrete is to be placed shall be moistened thoroughly so that moisture will not be drawn from the freshly placed concrete.

c. Surfaces of construction and contraction joints. - The surfaces of existing concrete to which new concrete is to be bonded and the surfaces of concrete placed under these specifications to which new concrete is to adhere, that have become

concrete; and having a maximum slump of 4 inches; placed several inches deep on the joint at the bottom of the placement.

Retempering of concrete will not be permitted. Any concrete which has become so stiff that proper placing cannot be assured shall be wasted. Concrete shall be deposited in all cases as nearly as practicable directly in its final position and shall not be caused to flow such that the lateral movement will permit or cause segregation of the coarse aggregate from the concrete mass. Methods and equipment employed in depositing concrete in forms shall be such as will not result in clusters or groups of coarse aggregate particles being separated from the concrete mass, but if clusters do occur they shall be scattered before the concrete is vibrated. A few scattered individual pieces of coarse aggregate that can be restored into the mass by vibration will not be objectionable.

Except as intercepted by joints, all formed concrete shall be placed in continuous approximately horizontal layers, the depths of which generally shall not exceed 20 inches. The Government reserves the right to require lesser depths of layers where concrete in 20-inch layers cannot be placed in accordance with the requirements of these specifications. All intersections of construction joints with concrete surfaces which will be exposed to view shall be made straight and level or plumb.

In placing unformed concrete on slopes so steep as to make internal vibration of the concrete impracticable without forming, the concrete shall be placed ahead of nonvibrated slip-form screed extending approximately 2 and 1/2 feet back from its leading edge. Concrete ahead of the slip-form screed shall be consolidated by internal vibrators so as to insure complete filling under the slip-form.

If concrete in top slabs, or other similar parts of structures is placed monolithically with supporting concrete, the following instructions shall be strictly observed:

(1) Placing of concrete shall be delayed from 1 to 3 hours at the bottoms of bevels under top slabs, or other similar parts of structures when bevels are specified and at the bottom of such structure members when bevels are not specified; but in no case shall the placing be delayed so long that the vibrating unit will not readily penetrate of its own weight the concrete placed before the delay. When consolidating concrete placed after the delay, the vibrating unit shall penetrate and revibrate the concrete placed before the delay.

(2) The last 2 feet or more of concrete placed immediately before the delay shall be placed with as low a slump as practicable, and special care shall be exercised to effect thorough consolidation of the concrete.

(3) The surfaces of concrete where delays are made shall be clean and free from loose and foreign material when concrete placing is started after the delay.

(4) Concrete placed in top slabs, and other similar parts of structures shall be placed with as low a slump as practicable and special care shall be exercised to effect thorough consolidation of the concrete.

dimension, the recesses shall be filled with dry pack: Provided, That filling of such recesses in surfaces designated to receive Finish F1 will be required only where the recesses are deeper than 1 inch. Where bulges and abrupt irregularities protrude outside the limits specified in Paragraph 5.14 (Finishes and Finishing) on formed surfaces for which Finish F2 is required, the protrusions shall be reduced by bushhammering and grinding so that the surfaces are within the specified limits.

Dry pack shall be used for filling holes having at least one surface dimension little, if any, greater than the hole depth; for narrow slots cut for repair of cracks; for grout pipe recesses; and for tie-rod fastener recesses as specified. Dry pack shall not be used for filling behind reinforcement or for filling holes that extend completely through a concrete section. Mortar filling, placed under impact by use of a mortar gun, may be used for repairing defects on surfaces designated to receive F1 and F2 finishes where the defects are too wide for dry-pack filling and too shallow for concrete filling and no deeper than the far side of the reinforcement that is nearest the surface. Concrete filling shall be used for holes extending entirely through concrete sections; for holes in which no reinforcement is encountered and which are greater in area than 1 square foot and deeper than 4 inches; and for holes in reinforced concrete which are greater in area than one-half of 1 square foot and which extend beyond reinforcement.

All materials used in the repair of concrete shall conform to the requirements of these specifications and the repairs shall be made in accordance with the procedures of Chapter VII of the Seventh Edition of the Bureau of Reclamation Concrete Manual. All fillings shall be bonded tightly to the surfaces of the holes and shall be sound and free from shrinkage cracks and drummy areas after the fillings have been cured and have dried. The costs of all materials, labor, and equipment required in the repair of concrete shall be borne by the contractor.

## 5.14 FINISHES AND FINISHING

a. General. - Allowable deviations from plumb or level and from the alinement, profile grades, and dimensions shown on the drawings are specified in Paragraph 5.18 (Tolerances for Concrete Construction), are defined as "tolerances" and are to be distinguished from irregularities in finish as described herein. The classes of finish and the requirements for finishing of concrete surfaces shall be as specified in this paragraph or as indicated on the drawings. The contractor shall keep the contracting officer advised as to when finishing of concrete will be performed. Unless inspection is waived in each specific case, finishing of concrete shall be performed only in the presence of a Government inspector. Concrete surfaces will be tested by the Government where necessary to determine whether surface irregularities are within the limits hereinafter specified.

U2. - Finish U2 (floated finish) applies to unformed surfaces not permanently concealed by fill material or concrete, or not required to receive Finish U1, or U4. Floating may be performed by use of hand- or power-driven equipment. Floating shall be started as soon as the screeded surface has stiffened sufficiently, and shall be the minimum necessary to produce a surface that is free from screed marks and is uniform in texture. Surface irregularities, measured as described in Subparagraph a., shall not exceed one-fourth of an inch. Joints and edges shall be tooled where shown on the drawings or directed.

U4. - Finish U4 applies to canal linings. The finished surface shall be equivalent in evenness, smoothness, and freedom from rock pockets and surface voids to that obtainable by effective use of a long-handled steel trowel. Light surface pitting and light trowel marks will not be considered objectionable. Where the surface produced by a lining machine meets the specified requirements, no further finishing operations will be required. Surface irregularities, measured as described in Subparagraph a., shall not exceed one-fourth of an inch for bottom slabs and one-half of an inch for side slopes.

## 5.15 PROTECTION

The contractor shall protect all concrete against injury until final acceptance by the Government. Immediately following the first frost in the fall, the contractor shall be prepared to protect all concrete against freezing. After the first frost, and until the mean daily temperature in the vicinity of the worksite falls below 40° F for more than 1 day, the concrete shall be protected against freezing temperatures for not less than 48 hours after it is placed. After the mean daily temperature in the vicinity of the worksite falls below 40° F for more than 1 day, the concrete shall be maintained at a temperature not lower than 50° F for at least 72 hours after it is placed.

Concrete cured by membrane curing will require no additional protection from freezing if the protection at 50° F for 72 hours is obtained by means of approved insulation in contact with the forms or concrete surfaces; otherwise, the concrete shall be protected against freezing temperatures for 72 hours immediately following 72 hours protection at 50° F. Concrete cured by water curing shall be protected against freezing temperatures for 3 days immediately following the 72 hours of protection at 50° F.

Discontinuance of protection against freezing temperatures shall be such that the drop in temperature of any portion of the concrete will be gradual and will not exceed 40° F in 24 hours. After March 15, when the mean daily temperature rises above 40° F for more than 3 successive days, the specified 72-hour protection at a temperature not lower than 50° F may be discontinued for as long as the mean daily temperature remains

Sealing compound shall be applied to the concrete surfaces by spraying in one coat to provide a continuous, uniform membrane over all areas. Coverage shall not exceed 150 square feet per gallon and on rough surfaces coverage shall be decreased as necessary to obtain the required continuous membrane. The repair of surface imperfections shall not be made until after application of sealing compound.

When sealing compound is used on unformed concrete surfaces, application of the compound shall commence immediately after finishing operations are completed. When sealing compound is to be used on formed concrete surfaces, the surfaces shall be moistened with a light spray of water immediately after the forms are removed and shall be kept wet until the surfaces will not absorb more moisture. As soon as the surface film of moisture disappears but while the surface still has a damp appearance, the sealing compound shall be applied. Special care shall be taken to insure ample coverage with the compound at edges, corners, and rough spots of formed surfaces. After application of the sealing compound has been completed and the coating is dry to touch, any required repair of concrete surfaces shall be performed. Each repair, after being finished, shall be moistened and coated with sealing compound in accordance with the foregoing requirements.

Equipment for applying sealing compound and the method of application shall be in accordance with the provisions of Chapter VI of the Seventh Edition of the Bureau of Reclamation Concrete Manual. Traffic and other operations by the contractor shall be such as to avoid damage to coatings of sealing compound for a period of not less than 28 days. Where it is impossible because of construction operations to avoid traffic over surfaces coated with sealing compound, the membrane shall be protected by a covering of sand or earth not less than 1 inch in thickness or by other effective means. The protective covering shall not be placed until the sealing membrane is completely dry. Before final acceptance of the work, the contractor shall remove all sand or earth covering in an approved manner. Any sealing membrane that is damaged or that peels from concrete surfaces within 28 days after application, shall be repaired without delay and in an approved manner. Sealing compound will be accepted on manufacturer's certification of compliance with specifications: Provided, That the Government reserves the right to require submission of and to perform tests on samples of the compound prior to shipment and use in the work and to sample and test the compound after delivery at the jobsite. The contractor shall provide, without charge to the Government, such facilities and assistance as may be necessary for procurement of test samples. Sampling will be in accordance with Designation 38 of the Seventh Edition of the Bureau of Reclamation Concrete Manual.

d. Costs. - The costs of furnishing and applying all materials used for curing concrete shall be included in the price bid in the schedule for the concrete on which the curing materials are used.

At least 30 days before scheduled concrete placement, the contractor shall submit to the Commissioner, International Boundary and Water Commission, Post Office Box 1859, El Paso, Texas 79950, for informational and record purposes three prints of each drawing prepared by the contractor to facilitate fabrication and placement of reinforcement.

e. Measurement and payment. - Measurement for payment for furnishing and placing reinforcing bars will be made only of the weight of the bars placed in the concrete in accordance with the drawings or as directed.

Payment for furnishing and placing reinforcing bars will be made at the unit price per pound bid therefor in the schedule which unit price shall include the cost of furnishing and attaching wire ties and metal or other approved supports, if used; and of cutting, bending, cleaning, and securing and maintaining in position, all reinforcing bars as shown on the drawings.

## 5.18 TOLERANCES FOR CONCRETE CONSTRUCTION

a. General. - Permissible surface irregularities for the various classes of concrete surface finish as specified in Paragraph 5.14 (Finishes and Finishing) are defined as "finishes," and are to be distinguished from tolerances as described herein: The intent of this paragraph is to establish tolerances that are consistent with modern construction practice, yet governed by the effect that permissible deviations will have upon the structural action or operational function of the structure. Deviations from the established lines, grades, and dimensions will be permitted to the extent set forth herein: Provided, That the Government reserves the right to diminish the tolerances set forth herein if such tolerances impair the structural action or operational function of a structure. Where tolerances are not stated in the specifications or drawings for any individual structure or feature thereof, permissible deviations will be interpreted conformably to the provisions of this paragraph. Notations on the drawings, included in these specifications, of specific maximum or minimum tolerances in connection with any dimension shall be considered as supplemental to the tolerances specified herein. The contractor shall be responsible for setting and maintaining concrete forms sufficiently within the tolerance limits so as to insure completed work within the tolerances specified herein. Concrete work that exceeds the tolerance limits specified herein shall be remedied or removed and replaced at the expense of and by the contractor.

b. Tolerances for concrete canal structures. -

| | |
|---|---|
| (3) Rectangular flume: | |
| (a) Departure from established alinement | ..... 1 inch |
| (b) Departure from established grades | ..... 1 inch |
| (c) Variation from the plumb or the specified batter in the lines and surfaces of columns, piers, walls, and in arrises | Exposed, in 10 feet ..... 1/2 inch<br>Backfilled, in 10 feet ..... 1 inch |
| (d) Variation from the level or from the grades indicated on the drawings in slabs, beams, horizontal grooves, and railing offsets | Exposed, in 10 feet ..... 1/2 inch<br>Backfilled, in 10 feet ..... 1 inch |
| (4) Variation in cross-sectional dimensions of piers, slabs, walls, beams and similar parts of the structures in Section (3) above | Minus ..... 1/4 inch<br>Plus ..... 1/2 inch |
| (5) Variation in thickness of bridge slabs | Minus ..... 1/8 inch<br>Plus ..... 1/4 inch |
| (6) Footings: | |
| (a) Variation of dimensions in plan | Minus ..... 1/2 inch<br>Plus ..... 2 inches |
| (b) Misplacement or eccentricity | 2 percent of the footing width in the direction of misplacement but not more than ..... 2 inches |
| (c) Reduction in thickness | ..... 5 percent of specified thickness |

c. Tolerances for placing reinforcement steel. -

| | |
|---|---|
| (1) (a) Variation of protective covering | With 1 and 1/2- and 2-inch cover ..... 1/4 inch<br>With 3-inch cover ..... 1/2 inch |
| (b) Variation from indicated spacing | ..... 1 inch |

# SECTION 6 - DRAWINGS

## 6.01 DRAWINGS

a. List of drawings. - The following drawings are made a part of these specifications:

### Franklin Canal Relocation

General:

1. 20300--(23-D-526)--Location Map.
2. 20301--(23-D-527)--General Plan.
3. 20302--(23-D-528)--Profile.
4. 20303--(23-D-529)--Typical Canal And Earthwork Sections.

Logs of exploration:

5. 20311--(23-D-556)--(sheet 1 of 4).
6. 20312--(23-D-557)--(sheet 2 of 4).
7. 20313--(23-D-558)--(sheet 3 of 4).
8. 20314--(23-D-559)--(sheet 4 of 4).

Structures:

9. 20304--(23-D-530)--Railroad Culverts.
10. 20305--(23-D-531)--Storm Sewer Modifications.
11. 20306--(23-D-532)--Rectangular Flume.
12. 20307--(23-D-533)--Second Street Turnout.

### Standard Drawings

13. 40-D-2867 --Rubber Waterstops--Types "A," "B," "G," And "H."
14. 40-D-5927 --Typical Safety Ladder For Concrete Lined Canals.
15. 40-D-5806 --Precast Concrete Pipe Joint--Bell And Spigot--Type R-3 (Pipe Wall Thickness 2" To 4-1/2" Incl.).
16. 40-D-5807 --Precast Concrete Pipe Joint--Bell And Spigot--Type R-3 (Pipe Wall Thickness 4-5/8" And Larger).
17. 40-D-5808 --Precast Concrete Pipe Joint--Bell And Spigot--Type R-4 (Pipe Wall Thickness 2" To 4-1/2" Incl.).

Blasting will not be permitted. If runways are cut into canal slopes below the top of canal lining they shall be refilled with selected material and compacted as provided in Subparagraph 1.05b. (Construction of Embankments).

As part of the work of excavating for canal the contractor shall remove all of the concrete lining from the prism of the existing canal at locations where the relocated canal intersects the existing canal. The lining shall be removed along the existing canal between the outside toes of the relocated canal embankments.

Insofar as practicable, the finishing operations required on canal sections shall be performed by the contractor simultaneously with the canal excavation.

The canal shall be excavated to a subgrade and section as shown on the drawings or as directed to provide for the prescribed thickness of lining. Care shall be taken to prevent overbreakage or loosening of material on bottoms and side slopes upon or against which lining is to be placed. Where the original ground surface is below the grade of the canal, the bottom of the canal shall be filled to the underside of the lining as prescribed for constructing and compacting the canal embankments.

Highly permeable or otherwise unsuitable material shall be removed as prescribed on Drawing No. 4 (20303) (23-D-529) and elsewhere as directed and refilled with compacted embankment.

The foundation for the lining shall be trimmed in accordance with Paragraph 3.03 (Trimming Earth Foundations for Canal Lining).

b. Costs. - No direct payment will be made for excavation for canal and the costs thereof shall be included in the unit price per cubic yard bid in the schedule for canal embankment, which price shall include the costs of all work described in this paragraph, including ripping, placing the material in embankment at locations directed or otherwise disposing of the excavated materials, of pumping or unwatering, and all work necessary to maintain the excavations in good order during construction.

## 1.03. EXCAVATION FROM BORROW

a. General. - Where the canal excavation at any section does not furnish sufficient suitable material for embankments, borrow material shall be obtained from the right-of-way of the Rio Grande channel relocation at points designated by the contracting officer. Excavation from the borrow areas, shall not be made to elevations lower than the bottom grade or outside the limits of the prism of the proposed Rio Grande channel relocation, as determined by the contracting officer. The surface of borrow pits shall be left in a reasonably smooth and even condition approved by the contracting officer. Where necessary, as determined by

side slopes shown on the drawings or prescribed by the contracting officer: Provided, That where not to be covered with concrete, the density of a 2-foot thickness, horizontal measurement, of compacted embankment parallel and adjacent to the inside slope line may be less than 95 percent of laboratory standard where it is impractical to obtain the 95 percent density with standard rolling equipment. All materials in embankments to be compacted shall be placed, moistened, and compacted as provided in Paragraph 1.09 (Compacting Earth Materials).

The contractor's operations in the excavation of materials for the compacted embankment shall be such as will result in an acceptable gradation of materials to provide for impermeability and stability when compacted. The maximum dimensions of stones placed in the compacted embankment shall not exceed 5 inches; and should stones larger than 5 inches be found in otherwise approved material, they shall be removed prior to compacting operations.

Where the original ground surface is below the grade of the canal and where compacted fill below the bottom of the canal is prescribed, such fill shall be placed as compacted embankment. Where the original ground surface is below the base of a structure, or where sloping concrete walls or slabs extend above the original ground surface and it is practicable as determined by the contracting officer to construct the walls or slabs directly on earth foundation without the use of intervening forms, compacted embankments shall be constructed to lines and grades as directed to form suitable foundations for the structure or for the sloping walls or slabs.

c. Measurement and payment. - Measurement, for payment, of compacted embankments will be made to the lines shown on the drawings, as specified in other paragraphs, or as prescribed by the contracting officer, including a 6-inch layer of the foundation for the embankment scarified or plowed as provided in Paragraph 1.04 (Preparation of Surfaces under Embankments). Payment for compacted embankments will be made at the unit price per cubic yard bid in the schedule for canal embankment, which unit price shall include the costs of canal excavation, excavation from borrow, and the cost of placing the materials in layers, furnishing water, moistening, and compacting as provided in this paragraph.

## 1.06. EXCAVATION FOR STRUCTURES

a. Measurement for payment. - Excavation for structures will be measured for payment to excavation pay lines shown on the drawings, or if not shown on the drawings to pay lines in accordance with the provisions of this paragraph. Regardless of quantities removed, measurement for payment will be made to the prescribed pay lines: Provided, That for purposes of safety

against the sides of the excavation without the use of intervening forms, measurement will be made only for excavation within the neatlines of the structure.

b. Foundations for structures. - Excavation for the foundation of structures shall be to the elevations shown on the drawings or established by the contracting officer. The contractor shall prepare the foundations at structure sites by methods which will provide firm foundations for the structures. The bottom and side slopes of excavation, upon or against which the structure is to be placed, shall be finished to the prescribed dimensions, and the surfaces so prepared shall be moistened and tamped with suitable tools to form firm foundations upon or against which to place the structure.

Where unsuitable material is encountered in the foundation for a structure, the contracting officer will direct additional excavation to remove the unsuitable material. This additional excavation shall be made to provide a minimum clearance between the undisturbed foundation and the underside of the structure and the additional excavation shall be refilled with compacted backfill to provide a firm foundation for the structure. Measurement and payment for excavation, backfill, and compacting backfill will be made to depths and dimensions directed.

If at any point in excavation the foundation material is excavated beyond the lines required to receive the structure, the overexcavation shall be filled with suitable materials and compacted in accordance with Paragraph 1.09 (Compacting Earth Materials). If at any point in excavation, the natural foundation material is disturbed or loosened during the excavation process or otherwise, it shall be compacted in place or, where directed, it shall be removed and replaced with suitable material and compacted in accordance with Paragraph 1.09 (Compacting Earth Materials). Any and all excess excavation or overexcavation performed by the contractor for any purpose or reason except for additional excavation as may be prescribed by the contracting officer, and whether or not due to the fault of the contractor, shall be at the expense of the contractor. Fill and compacting of fill for such excess excavation or overexcavation shall be at the expense of the contractor.

c. Payment. - Insofar as practicable, the material moved in excavation for structures shall be used for backfill and embankments, otherwise it shall be wasted as directed. Payment for excavation for structures will be made at the unit price per cubic yard bid therefor in the schedule. The unit price bid in the schedule for excavation for structures shall include the cost of all labor and materials for cofferdams and other temporary construction, of all pumping and unwatering, of all other work necessary to maintain the excavations in good order during construction, of removing such temporary construction, where required.

Refill of excavation performed outside of the established pay lines for excavation for structures shall be placed in the same manner as specified for the adjacent backfill, and such refill shall be placed at the expense of the contractor.

## 1.08. COMPACTING BACKFILL ABOUT STRUCTURES

a. General. - All backfill about structures shall be compacted as prescribed in this paragraph or as directed.

Where sloping concrete walls or slabs extend above the natural ground surface and it is practicable, as determined by the contracting officer, to construct the walls or slabs directly on earth foundations without the use of intervening forms, compacted embankments shall be constructed to lines and grades as directed to form suitable foundations for the sloping walls or slabs. The compacting of such earth foundations shall be in accordance with Paragraph 1.05 (Construction of Embankments) and payment therefor will be made at the unit price bid in the schedule for compacted embankments.

b. Material and compacting. - The material used for backfill to be compacted shall be selected material, containing no stones larger than 3 inches in diameter, approved by the contracting officer, and obtained from required excavation or approved borrow pits. To prevent unequal loading and displacement of a pipe, the backfill shall be placed and compacted in layers having essentially the same top elevation on each side of the barrel. All materials in backfill to be compacted shall be placed, moistened, and compacted as provided in Paragraph 1.09 (Compacting Earth Materials).

c. Measurement and payment. - Measurement for payment for compacting backfill about structures will be made in place to the lines shown on the drawings, as prescribed in this paragraph, or as directed by the contracting officer and will be made only for the quantities actually compacted within the limits of the established pay lines for backfill about structures, and the compacting of refill outside of excavation pay lines shall be performed at the expense of the contractor. Payment for compacting backfill about structures will be made at the unit price per cubic yard bid therefor in the schedule and will be in addition to the payment made for backfill about structures. The unit price bid in the schedule for compacting backfill about structures shall include the costs of furnishing water and moistening the materials.

## 1.09. COMPACTING EARTH MATERIALS

a. General. - Where compacting of earth materials is required, the materials shall be deposited in horizontal layers and compacted as specified in this paragraph. The excavation, placing, moistening, and compacting operations shall be such that the material will be uniformly compacted throughout the required section and will be homogeneous, free from lenses, pockets, streaks, laminations, or other imperfections.

c. Compacting cohesionless materials. -

(1) Compacting cohesionless free-draining materials. - Where compaction of cohesionless free-draining materials, such as sands and gravels, is required, the materials shall be deposited in horizontal layers and compacted to the relative density specified below. The excavating and placing operations shall be such that the materials, when compacted, will be blended sufficiently to secure the highest practicable unit weight and best stability. Water shall be added to the materials as may be required to obtain the specified density by method of compaction being used.

The thickness of the horizontal layers after compaction shall not be more than 6 inches if compaction is performed by tampers or rollers, not more than 12 inches if compaction is performed by treads of crawler-type tractors, surface vibrators, or similar equipment, and not more than the penetrating depth of the vibrator if compaction is performed by internal vibrators.

The relative density of the compacted material shall be not less than 70 percent as determined by the standard Bureau of Reclamation relative density tests for cohesionless free-draining soils.

(a) Relative density test. - The relative density tests will be made by the Government. The relative density of a cohesionless free-draining soil, expressed as a percentage, is defined as its state of compactness with respect to the loosest and most compact states at which it can be placed by laboratory procedures. The relative density will be based on the following formula, wherein the maximum density is the highest unit weight of the soil, minimum density is the lowest unit weight of the soil, and in-place density is the unit weight of the soil in place. Tests for moisture content are made on the materials and the unit weights are expressed in terms of ovendry weights.

$$\text{Rel. Den. } (\%) = \frac{\text{max. den. x (in-place den. - min. den.)}}{\text{in-place den. x (max. den. - min. den.)}} \times 100$$

(2) Compacting cohesionless materials containing some clay and silt. - Cohesionless materials containing clay and silt may not be free draining. When compaction of cohesionless materials containing sufficient clay and silt as to impede free drainage is required, the material shall be placed and compacted in accordance with the provisions of c.(1) above. These materials shall be compacted to a dry density in accordance with either of the following control tests whichever shows the higher dry unit weight.

(a) Ninety-five percent of the laboratory standard maximum soil density (dry) as determined by the Bureau of Reclamation Proctor Compaction Test as prescribed in b.(1) above, or

(b) The dry density of the material at 70 percent relative density as determined by the relative density test as prescribed in c.(1)(a) above.

Any royalties or other charges required to be paid for materials taken from deposits not owned and controlled by the Government shall be paid by the contractor. The approval of deposits by the contracting officer shall not be construed as constituting approval of all or any specific materials taken from the deposits and the contractor will be held responsible for the suitability of all materials used in the work.

The sizes of rock to be used in the riprap are as follows:

| Riprap protection | |
|---|---|
| *Nominal thickness | 12 inches |
| Maximum size rock | 1 cu ft |
| Minimum size rock | 1 and 1/2 inches |

*Thickness of riprap not including bedding.

c. Placing. - The rock in riprap need not be hand placed, but shall be dumped and smoothed by moving rocks into position in such a manner as to insure that the material when in place is stable and without tendency to slide, and so that there will be no unreasonably large unfilled spaces within the riprap. The inclusion of rock spalls or gravel in an amount to fill the voids in riprap, but not in excess of that amount, as determined by the contracting officer, will be required. The inclusion of earth, sand, or rock dust in excess of 5 percent, by volume, in riprap will not be permitted.

All riprap shall be bedded kn a continuous layer of sand and gravel or sand and crushed rock 6 inches thick, reasonably well graded to a maximum of 1 and 1/2 inches in size.

d. Costs. - No direct payment will be made for riprap or sand and gravel bedding for riprap and the costs thereof shall be included in the unit prices bid in the schedule for other items of work.

Excavation outside of the normal canal prism required for the placing of bedding and riprap, will be measured to the prescribed outlines and depths and will be paid for as excavation for structures.

The location of all construction joints in concrete work shall be subject to approval, and the joints shall be constructed in accordance with Paragraphs 5.11 (Preparation for Placing) and 5.12 (Placing). The entire cost of constructing the joints shall be included in the price bid in the schedule for concrete in which the joints are required.

b. Contraction joints. - Contraction joints are joints placed in structures or slabs to provide for volumetric shrinkage of monolithic unit or movement between monolithic units. The joints shall be so constructed that there will be no bond between the concrete surfaces forming the joint. Reinforcement is never continuous across a contraction joint.

Contraction joints of the types shown on the drawings shall be constructed at the locations shown. The joints shall be made by forming the concrete on one side of the joint and allowing it to set before concrete is placed on the other side of the joint. The surface of the concrete first placed at a contraction joint shall be coated with sealing compound before the concrete on the other side of the joint is placed. The sealing compound shall conform to Bureau of Reclamation "Specifications for Sealing Compound for Curing Concrete," dated June 1, 1961.

Except as otherwise provided for furnishing and placing joint materials, the entire cost of constructing contraction joints shall be included in the prices bid in the schedule for the concrete in which the joints are required.

## 2.03 SPONGE RUBBER FILLER FOR CONCRETE JOINTS

a. General. - Sponge rubber shall be furnished and placed in the joints in concrete where shown on the drawings.

b. Materials. - Sponge rubber shall conform to Federal Specification HH-F-341c, for Type II, Class A, sponge rubber: Provided, That the load required to compress the test specimen to 50 percent of its thickness before test shall be not less than 50 nor greater than 150 pounds per square inch. Sponge rubber shall be stored in as cool a place as practicable, preferably at 70° F or less and in no case shall the rubber be stored in the open, exposed to the direct rays of the sun.

Copper nails shall conform to Federal Specification FF-N-105 for common copper wire nails.

Adhesive for fastening the sponge rubber in place shall be a nonbituminous adhesive as recommended by the manufacturer of the filler materials.

c. Installation. - The sponge rubber filler shall be cut to size and shape of the joint surface. The filler shall be secured to the concrete in an approved manner, with copper nails at approximately 12-inch centers, or by adhesive applied between the filler and the first-placed concrete.

| | Natural rubber | Synthetic rubber |
|---|---|---|
| Tensile strength, pounds per square inch, minimum | 3,500 | 3,000 |
| Tensile strength at 300 percent modulus, pounds per square inch, minimum | 1,450 | 1,150 |
| Elongation at break, percent, minimum | 500 | 450 |
| Shore durometer (Type A) | 60 to 70 | 60 to 70 |
| Specific gravity | 1.15 ± 0.03 | 1.15 ± 0.03 |
| Change in volume, water immersion, percent maximum (2 days at 70° C) | 5 | 5 |
| Compression set (constant deflection) percent of original deflection, maximum | 30 | 30 |
| Tensile strength after oxygen pressure test (48 hours, 70° C, 300 pounds per square inch) percent of tensile strength before aging, minimum | 80 | 80 |
| Elongation after oxygen pressure test (48 hours, 70° C, 300 pounds per square inch) percent of elongation before aging, minimum | 80 | 80 |

(2) Gum rubber and rubber cement. - Gum rubber and rubber cement shall be suitable for making field connections in rubber waterstops as described in Subparagraph f. below.

c. Fabrication. - The rubber waterstop may be molded or extruded. All material shall be molded or extruded and cured in such a manner that any cross section will be dense, homogeneous, and free from porosity and other imperfections. The following minor surface defects will be acceptable:

(1) Lumps and depressions not exceeding 1/4 inch in longest lateral dimensions and 1/16 inch deep with no limit to the frequency of occurrence.

(2) Lumps and depressions between 1/4 and 1/2 inch in longest lateral dimension and 3/32 inch deep as long as the frequency of occurrence does not exceed six in a 50-foot length, and there is at least 2 inches between any two such defects.

on test specimens cut from (a) test units taken from the finished rubber product or, (b) substitute samples furnished in accordance with Paragraph 3.5 of Section 6, Federal Test Method Standard No. 601.

(3) Methods of tests. - Tests shall be made in accordance with the following methods described in Federal Test Method Standard No. 601:

| | |
|---|---|
| Tensile strength | Method 4111 |
| Elongation | Method 4121 |
| Durometer | Method 3021 |
| Specific gravity | Method 14011 |
| Change in volume | Method 6211 |
| Compression set | Method 3311 |
| Oxygen pressure test | Method 7111, except the time interval of test shall be 48 ± 1/2 hours. |

(4) Data to be furnished by manufacturer. - One certified copy of all laboratory test reports representing each shipment of waterstop shall be mailed to the Commissioner, International Boundary and Water Commission, Post Office Box 1859, El Paso, Texas 79950.

e. Shipping and storing. - Rubber waterstop may be shipped in rolls to facilitate handling, but if any roll of waterstop is not to be installed in a structure within 6 months after receipt of the material, the roll shall be loosened. All waterstop shall be stored in as cool a place as practicable, preferably at 70° F or less. Waterstop shall not be stored in the open or where it will be exposed to the direct rays of the sun.

f. Installation. -

(1) General. - The waterstop shall be installed with approximately one-half of the width of the material embedded in the concrete on each side of the joint. Care shall be exercised in placing and vibrating the concrete about the waterstop to insure complete filling of the concrete forms under and about the waterstop and to obtain a continuous bond between the concrete and the waterstop at all points around the periphery of the waterstop. In the event the waterstop is installed in the concrete on one side of a joint more than 1 month prior to the scheduled date of placing the concrete on the other side of the joint, the exposed waterstop shall be covered or shaded to protect it from the direct rays of the sun during the exposure.

(2) Field splices in Type "A," "B," "G," and "H" rubber waterstops. - All field splices in Type "A," "B," "G," and "H" rubber waterstops shall be molded splices. All molded splices shall be made by vulcanizing the splices in a steel mold as follows: The adjoining ends at splices shall be beveled

d. Payment. - Payment for concrete in canal lining will be made at the unit price per cubic yard bid therefor in the schedule, which price shall include the cost of making grooves and furnishing and placing mastic filler in the grooves. Payment will also be made for all cement in concrete placed within the neatlines of the canal lining. In addition, within the limits prescribed herein, payment will be made for cement used in concrete placed outside the neatlines of the canal lining. Determination of the amount of additional cement for which payment will be made will be based on each calendar day's lining placement and will in no case exceed 10 percent of the quantity of cement required within the neatlines of the lining placed on that calendar day. The cost of cement used in concrete placed outside of the neatlines in any calendar day which is in excess of the above percentage shall be at the expense of the contractor. The amount of concrete placed outside the neatlines of the canal will be determined by deducting the calculated volume of concrete within the neatlines of the lining from the volume of mixed concrete actually placed in the lining on that calendar day.

Payment for furnishing and handling cement will be made as provided in Paragraph 5.02 (Cement).

## 3.02 CANAL SAFETY LADDERS

a. General. - The contractor shall furnish and install safety ladders along the canal where and as shown on Drawing No. 14 (40-D-5927). The ladder rungs shall be installed normal to the surface of the concrete lining and so that complete bond of the embedded bar with the concrete is obtained.

At each safety ladder location the concrete lining shall be painted yellow as shown on the drawing.

b. Materials. -

(1) All materials not defined herein by detail specifications shall be of high-class commercial grades suitable for the intended use.

(2) Paint shall conform to Federal Specifications for traffic paint, TT-P-115c, Class B, yellow.

c. Payment. - Payment for furnishing and installing rungs for safety ladders in concrete lining will be made at the unit price per rung bid therefor in the schedule.

No direct payment will be made for furnishing and applying paint and the costs thereof shall be included in the unit prices bid in the schedule for other items of work.

## 3.03 TRIMMING EARTH FOUNDATIONS FOR CONCRETE LINING

a. General. - The contractor shall trim and finish earth surfaces of the canal prism to provide a firm foundation for the concrete lining. The bottom and side slopes, including

with the engaged joint in concentric position (area of groove plus area of space between bell and spigot using average bell and spigot diameters and average depth of groove, calculated to the width of groove at surface of spigot), the gasket shall not be stretched more than 30 percent of its original length when seated in the spigot groove and the gasket deformations as prescribed above shall not be more than 50 percent and less than 15 percent. Stretched gasket diameters shall be calculated as being the original diameter divided by the square root of (1 + x) where "x" equals the percent of gasket stretch divided by 100. Determination of the percent of gasket deformation in an offcenter joint shall be based on the most unfavorable limits of the pipe manufacturer's tolerances.

e. Each gasket shall be manufactured to provide the volume of rubber required by the pipe manufacturer's joint design within a tolerance of plus or minus 2 percent for gaskets of less than 3/4-inch diameter and plus or minus 1 percent for gaskets of 3/4-inch diameter and larger. The actual stretch in each gasket will have to be varied from nominal stretch by an amount sufficient to compensate for manufacturing variations in the diameter of the gasket.

f. The tolerances permitted in the construction of the joint shall be that stated in the pipe manufacturer's design as approved.

g. The taper on all surfaces on the bells and/or spigots on which the rubber gaskets may bear during closure of the joint and at any degree of partial closure, except within the gasket groove, shall not exceed 2°. The surfaces of the bell and spigot shall be parallel within 1°. The bell and spigot on Type R-3 joints and the bell on Type R-4 joints shall be manufactured so that the surfaces over the Distance A shown on the drawings on which the gaskets may bear during closure shall extend not less than three-fourths inch away from the edge of the gasket at normal joint closure position.

h. The surfaces of the bell and spigot in contact with the gasket, and adjacent surfaces that may come in contact with the gasket within a joint movement range of three-fourths inch, shall be free from airholes, chipped or spalled concrete, laitance, or other defects, except that individual airholes in gasket-bearing areas may be filled with hand-placed, stiff, preshrunk 1:1 mortar of cement and fine sand with no other preparation than thorough washing with water. Such fillings shall be kept moist under wet burlap for at least 48 hours or steam cured for at least 12 hours. Airholes may be filled with an approved epoxy mortar.

i. The inside surface of the bell adjacent to the bell face shall be flared to facilitate joining the pipe sections without damaging or displacing the gasket."

During manufacturing, transporting, storing, and laying concrete pipe, the pipe shall not be dropped or subjected to any unnecessary jar, impact, or other treatment that might crack the

connecting space has been filled to the thickness of the pipe, it shall be wrapped with not less than No. 12-gage welded wire fabric at 2-inch spacing each way, which shall be furnished by the contractor, and this shall be covered with mortar as shown on the drawing. If concrete is used to make the connection, reinforcement for this collar shall be installed before concrete is placed and outside forms shall be sufficiently spaced from the pipe to provide proper cover for the collar reinforcement. Fabricated mitered pipe bends shall be encased in concrete as required on Drawing No. 23 (222-D-21534).

b. Payment. - No separate payment will be made for furnishing and placing or constructing bends, but the length of bends will be included in the length of pipe measured for payment as provided in Paragraph 4.04 (Measurement and Payment of Concrete Pressure Pipe). Separate payment will be made for concrete encasement of bends in accordance with Paragraph 4.04 (Measurement and Payment of Concrete Pressure Pipe).

## 4.03 LAYING CONCRETE PIPE

a. General. - Concrete pipe shall be laid to the lines and grades shown on the drawings or established by the contracting officer and to the following tolerances. Departure from and return to established alinement and grade shall not exceed 1/16 inch per foot of pipe with a total of not more than 1-inch departure.

Pipe trenches shall be kept free of water which might impair pipe joining operations at all times when pipe is being laid. Pipe trenches shall be carefully graded so as to provide uniform support along the bottom of pipe. At joints involving bells, excavation at the joint shall be of ample size to prevent the pipe bells from coming in contact with the subgrade. Pipe with elliptical reinforcement shall be laid with the axes of the reinforcement cages in the correct position, as shown by marking on the pipe: Provided, That a maximum deviation of 10° from the correct position will be permitted.

Locations of pipe bends are to be considered approximate and may be adjusted to fit the actual laying length of the pipe units furnished subject to the approval of the contracting officer.

As each unit of pipe is laid, it shall be so positioned with respect to the adjacent pipe unit and the joints shall be centered so as to minimize any offset on the inside of the pipe at the joint.

All backfill about pipe shall be placed carefully and simultaneously on each side of the pipe to avoid lateral displacement of the pipe and damage to the joints. All laying and joining operations to provide watertight pipe and pipe joints shall be the responsibility of the contractor. If adjustment of the

combination of these. Cement and sand and admixture or pozzolan, if used, for mortar in joints shall conform to the requirements for these materials as used in the concrete pipe. Hydrated lime shall be a standard commercial product as approved. Any mortar which has become so stiff that proper placement cannot be assured without retempering shall be wasted, and mortar shall be prepared in small batches so as to prevent stiffening before it is used. Mortar for filling grooves shall be of such consistency that it will adhere to the ends of the pipe. Mortar for bands shall be of such consistency as to be readily worked by the hands and bonded to the pipe walls, and remain in place without sagging. Mortar placed pneumatically for bands shall be applied with such consistencies and pressures as will provide satisfactory joints.

Grout used for filling joints by pouring shall be mixed in the proportion of one part of cement, by weight, to not more than one part, by weight, of sand passing No. 16 mesh screen, and thoroughly mixed to a consistency of thick cream.

## 4.04 MEASUREMENT AND PAYMENT OF CONCRETE PRESSURE PIPE

Measurement for payment for furnishing and laying concrete pressure pipe will be made along the centerline of the pipe from end to end of the pipe in place, including the length through bends, and closing sections, and no allowance will be made for lap of joints.

Payment for furnishing and laying concrete pressure pipe will be made at the applicable unit prices per linear foot bid therefor in the schedule. The unit prices bid in the schedule for furnishing and laying pipe shall include the entire cost of furnishing the pipe and all materials for pipe joints, bends, and closing sections; the cost of transporting the pipe and materials; the cost of all labor required in unloading, handling, hauling, and storing the pipe; preparing a suitable bedding and laying the pipe; and joining the pipe.

Payment for concrete in encasements of bends will be made as concrete in structures.

## 4.05 MODIFICATION OF STORM SEWERS

The 48- and 54-inch-diameter storm sewers crossing the relocated Franklin Canal at Hills Street shall be lowered to pass under the concrete-lined canal as shown on the drawings and as directed. The modification will require the removal of the existing storm sewer pipe and the laying of new pipe at lower grades.

The contractor shall remove the existing pipe in accordance with Paragraph 4.06 (Removal of Concrete Pipe).

The contractor shall furnish and lay new pipe and connect it to the existing storm sewerlines in accordance with Paragraph 4.01 (Concrete Pressure Pipe) through Paragraph 4.04 (Measurement and Payment of Concrete Pressure Pipe).

in other parts of structures and in canal lining. The Government reserves the right to require a lesser slump whenever concrete of such lesser slump can be consolidated readily into place by means of the vibration specified in Subparagraph 5.12c. (Placing). The use of buckets, chutes, hoppers, or other equipment which will not readily handle and place concrete of such lesser slump will not be permitted.

e. Tests. - The compressive strength of the concrete will be determined by the Government through the medium of tests of 6- by 12-inch cylinders made and tested in accordance with Designations 29 to 33, inclusive, of the Seventh Edition of the Bureau of Reclamation Concrete Manual. Slump tests will be made by the Government in accordance with Designation 22 of the Seventh Edition of the Bureau of Reclamation Concrete Manual. The contractor shall provide such facilities as may be necessary for procuring and handling representative test samples.

## 5.02 CEMENT

a. General. - Cement for concrete, mortar, and grout shall be furnished by the contractor. To prevent undue aging of sacked cement after delivery, the contractor shall use sacked cement in the chronological order in which it was delivered on the job. Each shipment of sacked cement shall be stored so that it may readily be distinguished from other shipments. Bins in which bulk cement is stored shall be weathertight. The bins shall be emptied and cleaned by the contractor when so directed; however, the intervals between required cleanings will normally not be less than 4 months. The cement shall be free from lumps and shall be otherwise undamaged when used in concrete. If the cement is delivered in paper sacks, empty paper sacks shall be burned.

The cement shall be Type II, low alkali, in accordance with Federal Specification SS-C-192g, and shall meet the false-set limitation specified therein. The contractor shall inform the contracting officer in writing, at least 30 days before first shipments are required, concerning the mill or mills from which the cement is to be shipped; whether cement will be ordered in bulk or in sacks; and the purchase order number, contract number, or other designation that will identify the cement to be used by the contractor.

b. Inspection. - The cement will be sampled and tested by the Government in accordance with Federal Test Method Standard No. 158a, except that the initial penetration obtained under Method 2501.1 will be 32 plus or minus 4 millimeters, and except that the note at the end of Method 2501.1 concerning variations in initial penetration will be disregarded. Acceptance tests, except for false set, will be made on samples taken as bins of cement are filled at the manufacturing plant and reserved for exclusive Government use. Acceptance tests for false set will

on bleeding by concrete containing the agent shall not apply. The agent shall be of uniform consistency and quality within each container and from shipment to shipment. Agents will be accepted on manufacturer's certification of compliance with specifications: Provided, That the Government reserves the right to require submission of and to perform tests on samples of the agent prior to shipment and use in the work and to sample and test the agent after delivery at the jobsite.

The amount of air-entraining agent used in each concrete mix shall be such as will effect the entrainment of the percentage of air shown in the following tabulation in the concrete as discharged from the mixer:

| Coarse aggregate maximum size in inches | Total air, percent by volume, of concrete |
|---|---|
| 3/4 inch | 6 plus or minus 1 |
| 1 and 1/2 inches | 4.5 plus or minus 1 |

The agent in solution shall be maintained at uniform strength and shall be added to the batch in a portion of the mixing water. This solution shall be accurately batched by means of a reliable mechanical batcher which shall be so constructed that the full measure of solution added to each batch of concrete can be observed in a sight gage by the plant operator prior to discharge of the solution into the mixer.

b. General. - Air-entraining agent used shall be furnished by the contractor, and the cost of the materials and all costs incidental to their use shall be included in the price bid in the schedule for concrete in which the materials are used.

## 5.04 WATER

The water used in concrete, mortar, and grout shall be free from objectionable quantities of silt, organic matter, alkali, salts, and other impurities.

## 5.05 SAND

a. General. - The term "sand" is used to designate aggregate in which the maximum size of particles is 3/16 of an inch. Sand for concrete, mortar, and grout shall be furnished by the contractor from any approved source as provided in Subparagraph d. and shall be natural sand, except that crushed sand may be used to make up deficiencies in the natural sand grading.

Any royalties or other charges required to be paid for materials taken from deposits not owned by the Government and controlled by the Bureau of Reclamation, shall be paid by the contractor.

| Screen No. | Individual percent, by weight retained on screen |
|---|---|
| 4 | 0 to 5 |
| 8 | 5 to 15(1) |
| 16 | 10 to 25(1) |
| 30 | 10 to 30 |
| 50 | 15 to 35 |
| 100 | 12 to 20(2) |
| Pan | 3 to 7 |

(1) If the individual percent retained on the No. 16 screen is 20 percent or less, the maximum limit for the individual percent retained on the No. 8 screen may be increased to 20 percent.
(2) Sand for concrete canal lining shall contain not less than 15 percent of material passing the No. 50 screen and retained on the No. 100 screen.

d. Test and approval. - If sand is to be obtained from a deposit not previously tested and approved by the Government, the contractor shall submit representative samples for preconstruction test and approval at least 30 days before the sand is required for use. The samples shall consist of approximately 200 pounds of sand.

The approval of deposits by the contracting officer shall not be construed as constituting the approval of all or any specific materials taken from the deposits, and the contractor will be held responsible for the specified quality of all such materials used in the work.

In addition to preconstruction test and approval of the deposit, the Government will test the sand during the progress of the work and the contractor shall provide such facilities as may be necessary for procuring representative samples.

## 5.06 COARSE AGGREGATE

a. General. - The term "coarse aggregate," for the purpose of these specifications, designates aggregate of sizes within the range of 3/16 of an inch to 1 and 1/2 inches or any size or range of sizes within such limits. The coarse aggregate shall be reasonably well graded within the nominal size ranges hereinafter specified. Coarse aggregate for concrete shall be furnished by the contractor from any approved source as provided in Subparagraph d. and shall consist of natural gravel or crushed rock or a mixture of natural gravel and crushed rock.

Coarse aggregate shall be finished screened on vibrating screens mounted over the batching plant, or at the option of the contractor, the screens may be mounted on the ground adjacent to the batching plant. The finish screens, if installed over the batching plant, shall be so mounted that the vibration of the screens will not be transmitted to, or affect the accuracy of the batching scales. The method and rate of feed shall be such that the screens will not be overloaded and will operate properly in a manner that will result in a finished product which consistently meets the grading requirements of these specifications. The finished products shall pass directly to the individual batching bins.

Separation of the coarse aggregate into the specified sizes, after finish screening, shall be such that, when the aggregate, as batched, is tested by screening on the screens designated in the following tabulation, the material passing the undersize test screen (significant undersize) shall not exceed 2 percent, by weight, and all material shall pass the oversize test screen:

| Size | Size of square opening in screen | |
|---|---|---|
| | For undersize test | For oversize test |
| 3/4-inch aggregate | No. 5 mesh (U.S. Standard screen) | 7/8 inch |
| 1 and 1/2-inch aggregate | 5/8 inch | 1 and 3/4 inches |

Screens used in making the tests for undersize and oversize will conform to ASTM Designation: E 11, with respect to permissible variations in average openings.

d. Test and approval. - If coarse aggregate is to be obtained from a deposit not previously tested and approved by the Government, the contractor shall submit representative samples for preconstruction test and approval at least 30 days before the coarse aggregate is required for use. The samples shall consist of approximately 200 pounds of the 3/16- to 3/4-inch size of coarse aggregate, and 100 pounds of the 3/4- to 1 and 1/2-inch coarse aggregate.

The approval of deposits by the contracting officer shall not be construed as constituting the approval of all or any specific materials taken from the deposits, and the contractor will be held responsible for the specified quality of all such materials used in the work.

In addition to preconstruction test and approval of the deposit, the Government will test the coarse aggregate during the progress of the work and the contractor shall provide such facilities as may be necessary for procuring representative samples.

and the equipment shall be readily adjustable to compensate for the varying weight of any moisture contained in the aggregates and for changes in concrete mix proportions.

The bottoms of the batching bins shall be so constructed that they will discharge readily and completely, or vibration shall be provided during discharge so that the full weights of materials are delivered each time. Batching equipment shall be constructed and operated so that the combined inaccuracies in feeding and measuring the materials will not exceed 1 percent for water, 1 and 1/2 percent for weighed cement, 2 percent for each size of aggregate, and 3 percent for admixtures. Weighing equipment shall be sufficiently insulated against vibration or movement of other operating equipment about the plant so that the accuracy of the delivered quantities of materials will not be impaired.

Bulk cement shall be weighed in an individual hopper and shall be kept separate from the aggregates until the batch ingredients are discharged from the batching hopper. The cement hopper may be attached to the aggregate scale for cumulative weighing. If materials are weighed cumulatively by dial scales, the cement shall be weighed before the other ingredients. If the materials are weighed cumulatively by beam scales, a separate beam shall be provided for weighing each material. Weighing equipment and the water-measuring device shall be in full view of the operator.

The contractor shall provide standard test weights and any other equipment required for checking the operating performance of each scale or other measuring device and shall make periodic tests over the ranges of measurements involved in the batching operations. The tests shall be made in the presence of a Government inspector, and shall be adequate to prove the accuracy of the measuring devices. Unless otherwise directed, tests of weighing equipment in operation shall be made at least once every month. The contractor shall make such adjustments, repairs, or replacements as may be necessary to meet the specified requirements for accuracy of measurement.

The operating mechanism in the water-measuring device shall be such that leakage will not occur when the valves are closed. Water tanks on portable mixers shall be constructed so that the indicating device will register, within the specified limit of accuracy, the quantity of water discharged, regardless of the inclination of the mixer.

Dispensers for air-entraining agent and calcium chloride solutions shall have sufficient capacity to measure at one time the full quantity of the properly diluted solution required for each batch, and shall be maintained in a clean and freely operating condition. Equipment for measuring shall be designed for convenient confirmation of the accuracy of the measurement for each batch and shall be so constructed that the required quantity can be added only once to each batch.

| Mixing time | |
|---|---|
| Capacity of mixer | Time of mixing |
| 2 cubic yards or less | 1 and 1/2 minutes |
| 3 cubic yards | 2 minutes |
| 4 cubic yards | 2 and 1/2 minutes |
| Larger than 4 cubic yards | To be determined by tests performed by the Government. |

Each mixer shall be equipped with a mechanically operated batch counter, and a timing and signaling device which will indicate completion of the required mixing period.

c. Truck mixers. - Each truck mixer shall be equipped with (1) an accurate watermeter between supply tank and mixer, the meter to have indicating dials and totalizer, (2) a reliable revolution counter, which can be readily reset to zero for indicating the total number of revolutions of the drum for each batch. Each mixer shall have affixed thereto a metal plate on which the drum capacities for both mixing and agitating are plainly marked in terms of volume of concrete in cubic yards and the maximum and minimum speeds of rotation of the drum in revolutions per minute.

Mixing shall be continued for not less than 50 nor more than 100 revolutions of the drum at the manufacturer's rated mixing speed after all the ingredients, except approximately 5 percent of the water which may be withheld, are in the drum. The mixing speed shall be not less than 5 nor more than 20 rpm. Thereafter, additional mixing, if any, shall be at the speed designated by the manufacturer of the equipment as agitating speed; except that after the addition of withheld water, mixing shall be continued at the specified mixing speed until the water is dispersed throughout the mix. After a period of agitation a few revolutions of the drum at mixing speed will be required just prior to discharging. In no case shall the specified maximum net water-cement ratio be exceeded.

When a truck mixer or agitator is used for transporting concrete the concrete shall be delivered to the site and the discharge completed within 1 and 1/2 hours after the introduction of the cement into the mixer. Each batch of concrete, when delivered at the jobsite from commercial ready mix plants, shall be accompanied by a written certificate of batch weights and time of batching.

Mixers shall be examined daily for changes in condition due to accumulation of hard concrete or mortar or to wear of blades. No mixer shall be charged in excess of its rated capacity for mixing or agitating; however, if any mixer cannot produce concrete meeting the requirements heretofore specified when mixing at rated capacity, within the specified limitation on the number of revolutions of the mixing drum at mixing speed,

formed surfaces. Where Finish F3 is specified, the sheathing or lining shall be placed so that the joint marks on the concrete surfaces will be in general alinement both horizontally and vertically. Where pine is used for form sheathing, the lumber shall be pinus ponderosa in accordance with the Standard Grading Rules of the Western Wood Products Association or shall be other lumber of a grading equivalent to that specified for pine. Plywood used for form sheathing or lining shall be Grade B-B, exterior, or better, in accordance with the commercial standards of the American Plywood Association. Materials used for form sheathing or lining shall conform with the following requirements, or may be other materials producing equivalent results:

| Required finish of formed surface | Wood sheathing or lining | Steel sheathing or lining* |
|---|---|---|
| F1 | Any grade - S2E | Steel sheathing permitted. Steel lining permitted. |
| F2 | No. 2 common or better, pine shiplap, or plywood sheathing or lining. | Steel sheathing permitted. Steel lining permitted if approved. |

*Steel "sheathing" denotes steel sheets not supported by a backing of wood boards. Steel "lining" denotes thin steel sheets supported by a backing of wood boards.

c. Form ties. - Embedded ties for holding forms shall remain embedded and, except where F1 finish is permitted, shall terminate not less than 2 diameters or twice the minimum dimension of the tie in the clear of the formed faces of the concrete. Where F1 finish is permitted, ties may be cut off flush with the formed surfaces. The ties shall be constructed so that removal of the ends or end fasteners can be accomplished without causing appreciable spalling at the faces of the concrete. Recesses resulting from removal of the ends of form ties shall be filled in accordance with Paragraph 5.13 (Repair of Concrete).

d. Cleaning and oiling of forms. - At the time the concrete is placed in the forms, the surfaces of the forms shall be free from encrustations of mortar, grout, or other foreign material. Before concrete is placed, the surfaces of the forms, shall be oiled with a commercial form oil that will effectively prevent sticking and will not soften or stain the concrete surfaces, or cause the surfaces to become chalky or dust producing. For

so rigid that the new concrete cannot be incorporated integrally with that previously placed, are defined as construction joints. The surfaces of construction joints shall be clean, rough, and surface dry when covered with fresh concrete. Cleaning shall consist of the removal of all laitance, loose or defective concrete, coatings, sand, sealing compound if used, and other foreign material. The surfaces of construction joints shall be wet sandblasted, washed thoroughly with air-water jets, and surface dried prior to placement of adjoining concrete. The sandblasting, washing, and surface drying shall be performed at the last opportunity prior to placing of concrete. Drying of the surface shall be complete and may be accomplished by air jet. The surfaces of all contraction joints shall be cleaned thoroughly of accretions of concrete or other foreign material by scraping, chipping, or other means approved by the contracting officer.

## 5.12 PLACING

a. Transporting. - The methods and equipment used for transporting concrete and the time that elapses during transportation shall be such as will not cause appreciable segregation of coarse aggregate, or slump loss in excess of 1 inch, in the concrete as it is delivered into the work.

b. Placing. - The contractor shall keep the contracting officer advised as to when placing of concrete will be performed. Unless inspection is waived in each specific case, placing of concrete shall be performed only in the presence of a duly authorized Government inspector.

The surfaces of all rock against which concrete is to be placed shall be cleaned and, except in those cases where seepage or other water precludes drying of the rock face, shall be dampened and brought to a surface-dry condition. Surfaces of highly porous or absorptive horizontal or nearly horizontal rock foundations to which concrete is to be bonded shall be covered with a layer of mortar approximately three-eighths of an inch thick prior to placement of the concrete. The mortar shall have the same proportions of water, air-entraining agent, cement, and sand as the regular concrete mixture, unless otherwise directed. The water-cement ratio of the mortar in place shall not exceed that of the concrete to be placed upon it, and the consistency of the mortar shall be suitable for placing and working in the manner hereinafter specified. The mortar shall be spread and shall be worked thoroughly into all irregularities of the surface. Concrete shall be placed immediately upon the fresh mortar.

A mortar layer shall not be used on concrete construction joints. Unless otherwise directed in formed work, structural concrete placements shall be started with an oversanded mix containing 3/4-inch maximum size aggregate; a maximum net water-cement ratio of 0.47, by weight; 6 percent air, by volume of

The contractor shall be entitled to no additional payment over the unit prices bid in the schedule for concrete by reason of any limitations in the placing of concrete required under the provisions of this paragraph.

c. Consolidation. - Concrete shall be consolidated to the maximum practicable density, so that it is free from pockets of coarse aggregate and entrapped air, and closes snugly against all surfaces of forms and embedded materials. Consolidation of concrete in structures shall be by electric- or pneumatic-drive, immersion-type vibrators. Concrete vibrators shall be operated at speeds of at least 7,000 rpm when immersed in the concrete.

In consolidating each layer of concrete the vibrator shall be operated in a near-vertical position and the vibrating head shall be allowed to penetrate and revibrate the concrete in the upper portion of the underlying layer. Layers of concrete shall not be placed until the layers previously placed have been worked thoroughly as specified. Care shall be exercised to avoid contact of the vibrating head with surfaces of the forms.

Consolidation of concrete in canal and lateral linings 3 inches or more in thickness shall be by electric- or pneumatic-driven, immersion-type vibrators.

The degree of consolidation in linings shall be equivalent to the results obtainable with first-class metal slip-form lining machines arranged for effective vibration of the concrete as placed.

## 5.13 REPAIR OF CONCRETE

Repair of concrete shall be performed by skilled workmen. The contractor shall keep the contracting officer advised as to when repair of concrete will be performed. Unless inspection is waived in each specific case, repair of concrete shall be performed only in the presence of a Government inspector. The contractor shall correct all imperfections on the concrete surfaces as necessary to produce surfaces that conform to the requirements specified in Paragraph 5.14 (Finishes and Finishing). Unless otherwise approved, repair of imperfections in formed concrete shall be completed within 24 hours after removal of forms. Fins and encrustations shall be neatly removed from surfaces for which Finish F2 is specified and encrustations shall be removed from surfaces for which Finish U2 is specified. Concrete that is damaged from any cause and concrete that is honeycombed, fractured, or otherwise defective, and concrete which, because of excessive surface depressions, must be excavated and built up to bring the surface to the prescribed lines, shall be removed and replaced with dry pack, mortar, or concrete, as hereinafter specified. If removal of the ends of form ties results in recesses larger than one-fourth of an inch in diameter or in the minimum

Surface irregularities are classified as "abrupt" or "gradual." Offsets caused by displaced or misplaced form sheathing or lining or form sections, or by loose knots in forms or otherwise defective form lumber will be considered as abrupt irregularities, and will be tested by direct measurements. All other irregularities will be considered as gradual irregularities, and will be tested by use of a template, consisting of a straight-edge or the equivalent thereof for curved surfaces. The length of the template will be 5 feet for testing of formed surfaces and 10 feet for testing of unformed surfaces.

b. Formed surfaces. - The classes of finish for formed concrete surfaces are designated by use of Symbols F1, and F2. No sack rubbing or sandblasting will be required on formed surfaces. No grinding will be required on formed surfaces, other than that necessary for repair of surface imperfections. Unless otherwise specified or indicated on the drawings, the classes of finish shall apply as follows:

F1. - Finish F1 applies to formed surfaces upon or against which fill material or concrete is to be placed. The surfaces require no treatment after form removal except for repair of defective concrete and filling of holes left by the removal of fasteners from the ends of tie rods as required in Paragraph 5.13 (Repair of Concrete), and the specified curing. Correction of surface irregularities will be required for depressions only, and only for those which, when measured as described in Subparagraph a., exceed 1 inch.

F2. - Finish F2 applies to all formed surfaces not permanently concealed by fill material or concrete, such as those of the usual canal structures. Surface irregularities, measured as described in Subparagraph a. shall not exceed one-fourth of an inch for abrupt irregularities and one-half of an inch for gradual irregularities.

c. Unformed surfaces. - The classes of finish for unformed concrete surfaces are designated by the Symbols U1, U2, and U4. Interior surfaces shall be sloped for drainage where shown on the drawings or directed. Surfaces which will be exposed to the weather and which would normally be level, shall be sloped for drainage. Unless the use of other slopes or level surfaces is indicated on the drawings or directed, narrow surfaces, such as tops of walls shall be sloped approximately three-eighths of an inch per foot of width; broader surfaces, such as platforms, and decks shall be sloped approximately one-fourth of an inch per foot. Unless otherwise specified or indicated on the drawings, these classes of finish shall apply as follows:

U1. - Finish U1 (screeded finish) applies to unformed surfaces that will be covered by fill material or by concrete. Finish U1 is also used as the first stage of Finish U2. Finishing operations shall consist of sufficient leveling and screeding to produce even uniform surfaces. Surface irregularities, measured as described in Subparagraph a. shall not exceed three-eighths of an inch.

above 40° F: Provided, That the concrete shall be protected against freezing temperatures for not less than 48 hours after placement.

Where artificial heat is employed, special care shall be taken to prevent the concrete from drying. Use of unvented heaters will be permitted only when unformed surfaces of concrete adjacent to the heaters are protected for the first 24 hours from an excessive carbon dioxide atmosphere by application of sealing compound.

5.16 CURING

a. General. - Concrete shall be cured either by water curing in accordance with Subparagraph b. or by membrane curing in accordance with Subparagraph c. except as otherwise hereinafter provided. Surfaces of concrete in canal lining and in structures that will be exposed to view when the canal is empty shall be cured by membrane curing. The unformed top surfaces of walls and piers shall be moistened by covering with water-saturated material or by other effective means as soon as the concrete has hardened sufficiently to prevent damage by water. These surfaces and steeply sloping and vertical formed surfaces shall be kept completely and continually moist, prior to and during form removal, by water applied on the unformed top surfaces and allowed to pass down between the forms and the formed concrete faces. This procedure shall be followed by the specified water curing or membrane curing.

b. Water curing. - Concrete cured with water shall be kept wet for at least 14 days immediately following placement of the concrete or until covered with fresh concrete: Provided, That water curing of concrete may be reduced to 6 days during periods when the mean daily temperature in the vicinity of the worksite is less than 40° F: Provided further, That during the prescribed period of water curing, when temperatures are such that concrete surfaces may freeze, water curing shall be temporarily discontinued. The concrete shall be kept wet by covering with water-saturated material or by a system of perforated pipes, mechanical sprinklers, or porous hose, or by any other approved method which will keep all surfaces to be cured continuously (not periodically) wet. Water used for curing shall meet the requirements of these specifications for water used for mixing concrete.

c. Membrane curing. - Membrane curing shall be by application of a sealing compound which forms a water-retaining membrane on the surfaces of the concrete. The sealing compound shall be white pigmented and shall conform to Bureau of Reclamation "Specifications for Sealing Compound for Curing Concrete," effective June 1, 1961. The compound shall be of uniform consistency and quality within each container and from shipment to shipment.

## 5.17 REINFORCING BARS

a. Furnishing reinforcing bars. - The contractor shall furnish all the reinforcing bars required for completion of the work. Reinforcing bars shall conform to Federal Specification QQ-S-632b, Type II, Class B40, B50, B60, C40, C50, or R50: Provided, That all bars required to be bent to a radius of bend of 50-bar diameters or less shall be billet steel (Class B40, B50, or B60).

b. Placing reinforcing bars. - Reinforcing bars shall be placed in the concrete where shown on the drawings or where directed. Unless otherwise prescribed, placement dimensions shall be to the centerlines of the bars. Reinforcement will be inspected for compliance with requirements as to size, shape, length, splicing, position, and amount after it has been placed.

Before the reinforcement is embedded in concrete, the surfaces of the bars and the surfaces of any bar supports shall be cleaned of heavy flaky rust, loose mill scale, dirt, grease, or other foreign substances which, in the opinion of the contracting officer, are objectionable. Heavy flaky rust that can be removed by firm rubbing with burlap or equivalent treatment, is considered objectionable.

Reinforcing bars shall be accurately placed and secured in position so that they will not be displaced during the placing of the concrete, and special care shall be exercised to prevent any disturbance of the reinforcement in concrete that has already been placed. Chairs, hangers, spacers, and other supports for reinforcing bars may be of concrete, metal, or other approved material. Where portions of such supports will be exposed on concrete surfaces designated to receive F2 finish, the exposed portion of the supports shall be galvanized or noncorrodible material. The reinforcement in structures shall be so placed that there will be a clear distance of at least 1 inch between the reinforcement and any anchor bolts, form ties, or other embedded metalwork.

c. Reinforcement drawings to be prepared by the contractor. - Reinforcement detail drawings, for any structure, which the contractor may require to facilitate fabrication and placement of reinforcement shall be prepared by the contractor.

The contractor's reinforcement detail drawings shall be prepared from reinforcement design drawings included with these specifications.

d. Preparation and submittal of the contractor's reinforcement drawings. - The contractor's reinforcement drawings shall be prepared following the recommendations established by the American Concrete Institute's "Manual of Standard Practice for Reinforced Concrete Structures" (ACI 315-65). The contractor's drawings shall show sufficient details for checking the bars during placement and for use in establishing payment quantities. Reinforcement shall conform to the requirements shown on Drawing No. 19 (40-D-7004) unless otherwise shown on the reinforcement design drawings.

| | |
|---|---|
| (1) Concrete canal lining: | |
| (a) Departure from established alinement | ..... 2 inches on tangents<br>..... 4 inches on curves |
| (b) Departure from established profile grade | ..... 1 inch |
| (c) Reduction in thickness of lining | ..... 10 percent of specified thickness: Provided, That average thickness is maintained as determined by daily batch volumes |
| (d) Variation from specified width of section at any height | ..... 1/4 of 1 percent plus 1 inch |
| (e) Variation from established height of lining | ..... 1/2 of 1 percent plus 1 inch |
| (2) Railroad culverts and turnout: | |
| (a) Departure from established alinement | ..... 1 inch |
| (b) Departure from established profile grade | ..... 1 inch |
| (c) Variation in thickness | At any point ..... minus 2 and 1/2 percent or 1/4 inch, whichever is greater<br>At any point ..... plus 5 percent or 1/2 inch, whichever is greater |
| (d) Variation from inside dimensions | ..... 1/2 of 1 percent |

## 5.19 MEASUREMENT OF CONCRETE

Measurement, for payment, of concrete required to be placed directly upon or against surfaces of excavation will be made to the lines for which payment for excavation is made. Measurement, for payment, of concrete in canal lining will be made to the neatlines shown on the drawings. Measurement, for payment, of all other concrete will be made to the neatlines of the structures, unless otherwise specifically shown on the drawings or prescribed in these specifications. In measuring concrete for payment, the volume of all openings, recesses, ducts, embedded pipes, woodwork, and metalwork, each of which is larger than 100 square inches in cross section will be deducted.

## 5.20 PAYMENT

Payment for concrete in the various parts of the work will be made at the unit prices per cubic yard bid therefor in the schedule, which unit prices shall include the cost of all labor and materials required in the construction, except that payment for furnishing and handling cement, and payment for furnishing and placing reinforcement bars will be made at the unit prices bid therefor in the schedule.

18. 40-D-5809 --Precast Concrete Pipe Joint--Bell And Spigot--Type R-4 (Pipe Wall Thickness 4-5/8" And Larger).
19. 40-D-7004 --General Notes And Minimum Requirements For Detailing Reinforcement.

Reference Drawings

Existing Franklin Canal:

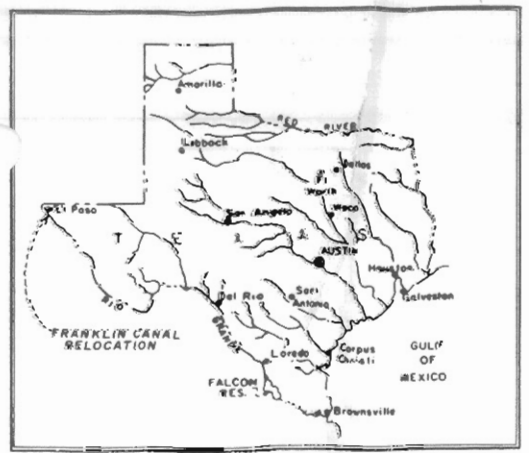
20. 23-503-5814 --Plan And Profile--Sta. 79+00 To Sta. 135+00.
21. 23-503-5815 --Plan And Profile--Sta. 135+00 To Sta. 190+00.
22. 20310--(23-D-536) --Sta. 78+51 To Sta. 146+74--Sections And Fencing Details.

Miscellaneous:

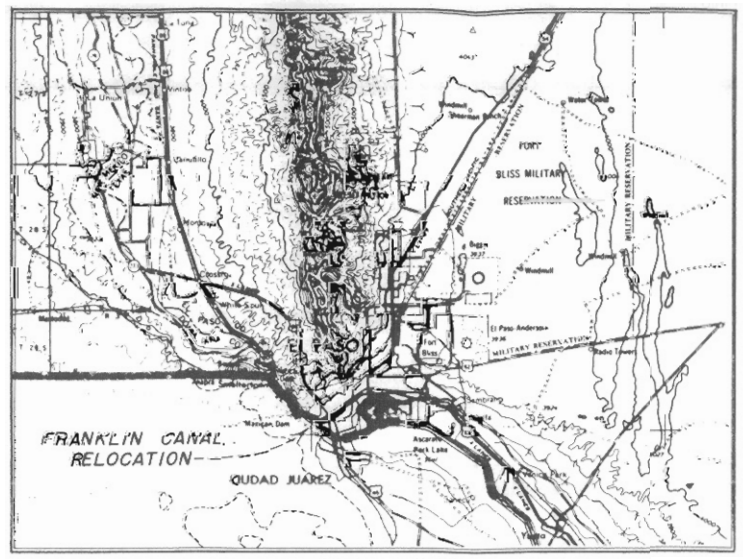
23. 222-D-21534 --Wahluke Branch Canal Laterals--Blocks 21 And 48--Bends For Precast Concrete Pressure Pipe.

b. General. - Where details shown on the 40-D- series Standard Drawings differ from those shown on other drawings or the requirements of these specifications, the details shown on the other drawings or required by the specifications shall govern.

c. Datums. - Elevations shown on the drawings are based on the International Boundary and Water Commission's Chamizal Project datum (IBWC Datum), unless otherwise noted. The USBR Datum plus 40.97 feet equals the IBWC Datum, and the El Paso Datum plus 7.17 feet equals the IBWC Datum.



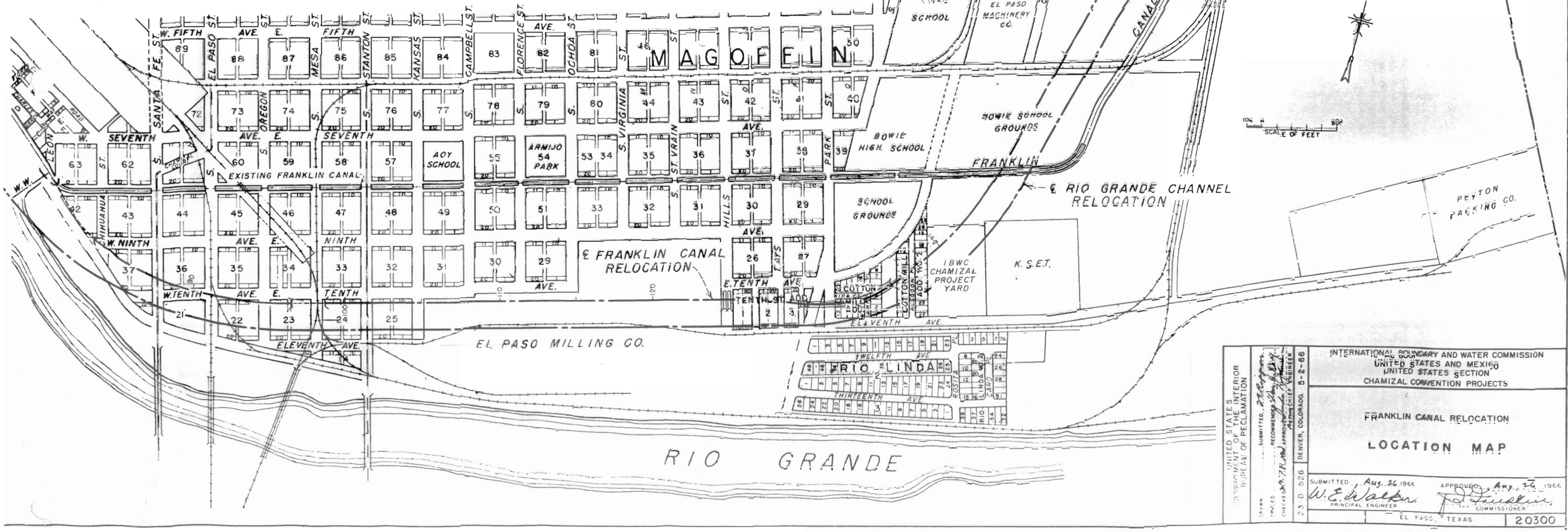

KEY MAP




VICINITY MAP

EXPLANATION

- TURNOUT
- CULVERT
- STORM SEWER
- FLUME




UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

DESIGNED ... DRAWN ... TRACED ... CHECKED ... SUBMITTED ... RECOMMENDED ... APPROVED ... CHIEF ENGINEER

23-D-526 DENVER, COLORADO, 5-2-66

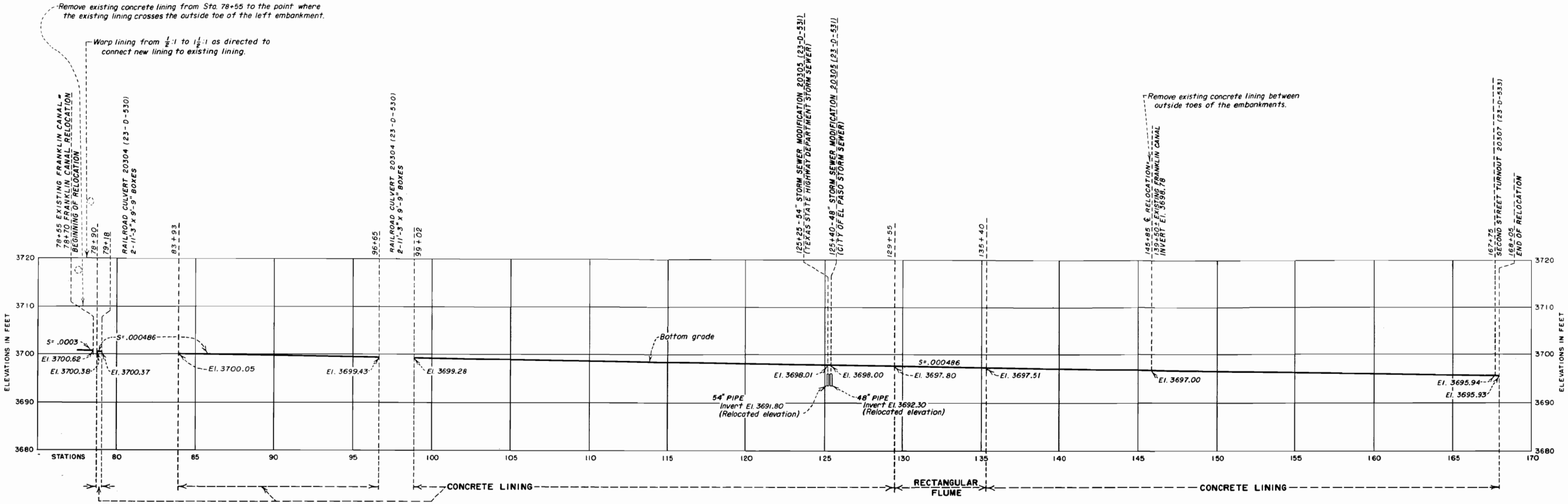
INTERNATIONAL BOUNDARY AND WATER COMMISSION
UNITED STATES AND MEXICO
UNITED STATES SECTION
CHAMIZAL CONVENTION PROJECTS

FRANKLIN CANAL RELOCATION

LOCATION MAP

SUBMITTED Aug. 26 1966 APPROVED Aug. 27 1966
W. E. Walker, PRINCIPAL ENGINEER — COMMISSIONER

EL PASO, TEXAS 20300




## NOTES

All elevations are on IBWC Datum.
IBWC Datum = USBR Datum plus 40.97'.
Stations are approximate and may be adjusted if required after the canal centerline is established in the field.
For hydraulic properties and details of canal, see 20303 (23-D-529)
For rectangular flume details, see 20306 (23-D-532)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

DRAWN M.E.K. SUBMITTED
TRACED W.D.A. RECOMMENDED
CHECKED APPROVED
CHIEF ENGINEER

23-D-528 DENVER, COLO. MAY 19, 1966

ALWAYS THINK SAFETY

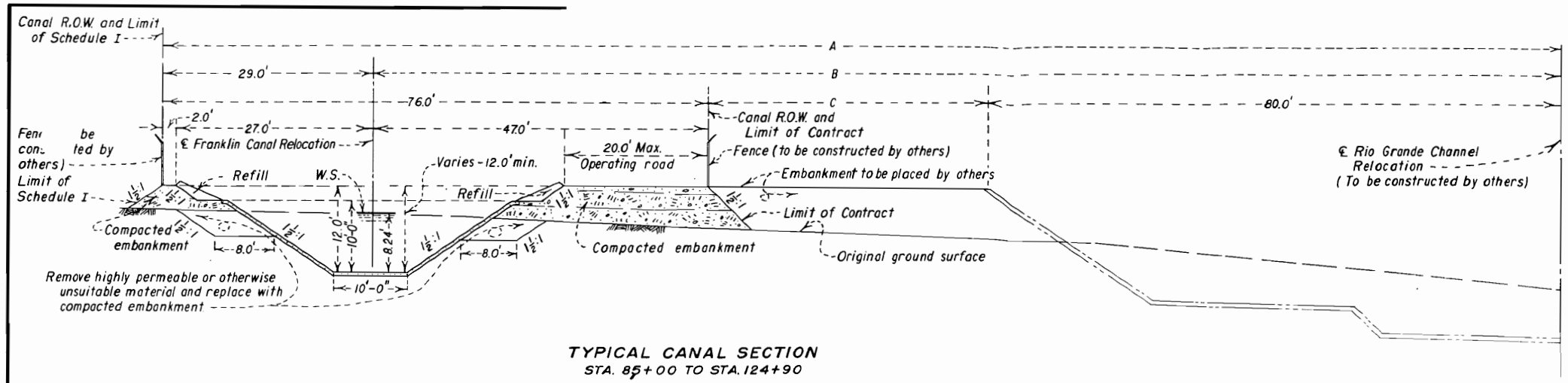
INTERNATIONAL BOUNDARY AND WATER COMMISSION
UNITED STATES AND MEXICO
UNITED STATES SECTION
CHAMIZAL CONVENTION PROJECTS

# FRANKLIN CANAL RELOCATION

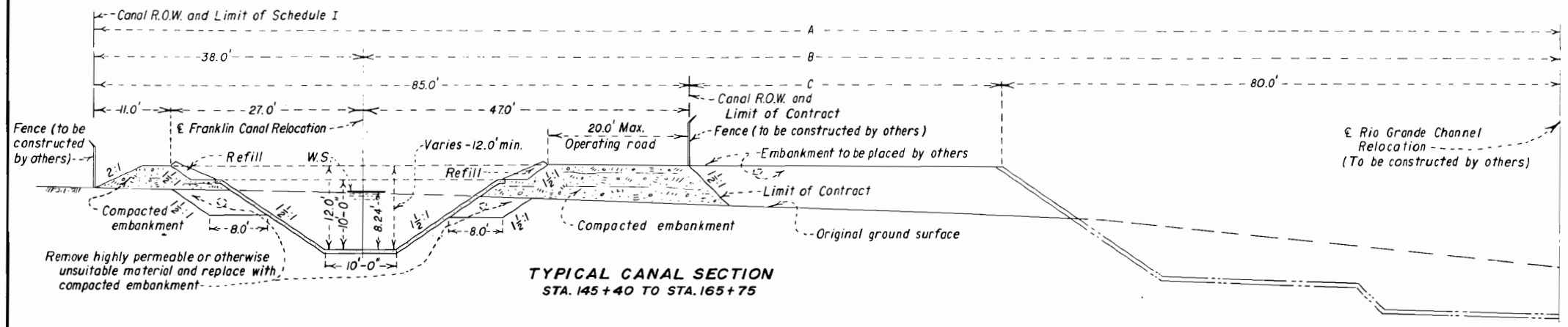
# PROFILE

SUBMITTED: Aug 26 1966 APPROVED: Aug. 26 1966
W. E. Walker — PRINCIPAL ENGINEER
J. L. Friedkin — COMMISSIONER

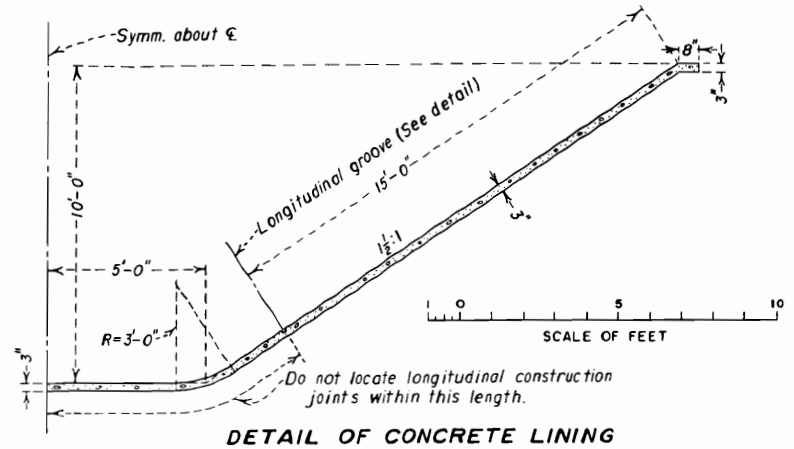
EL PASO, TEXAS 20302



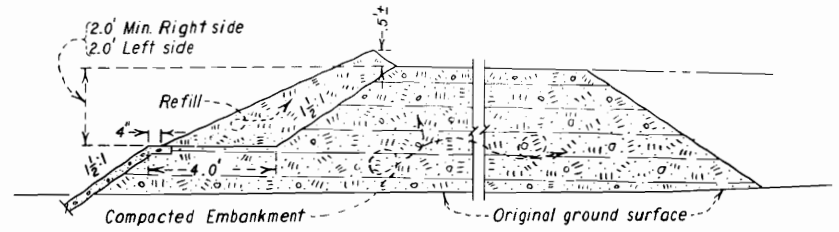

**TYPICAL CANAL SECTION**
STA. 85+00 TO STA. 124+90




**TYPICAL CANAL SECTION**
STA. 145+40 TO STA. 165+75



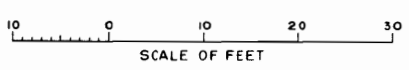

**DETAIL OF CONCRETE LINING**




**EMBANKMENT AND REFILL DETAILS**

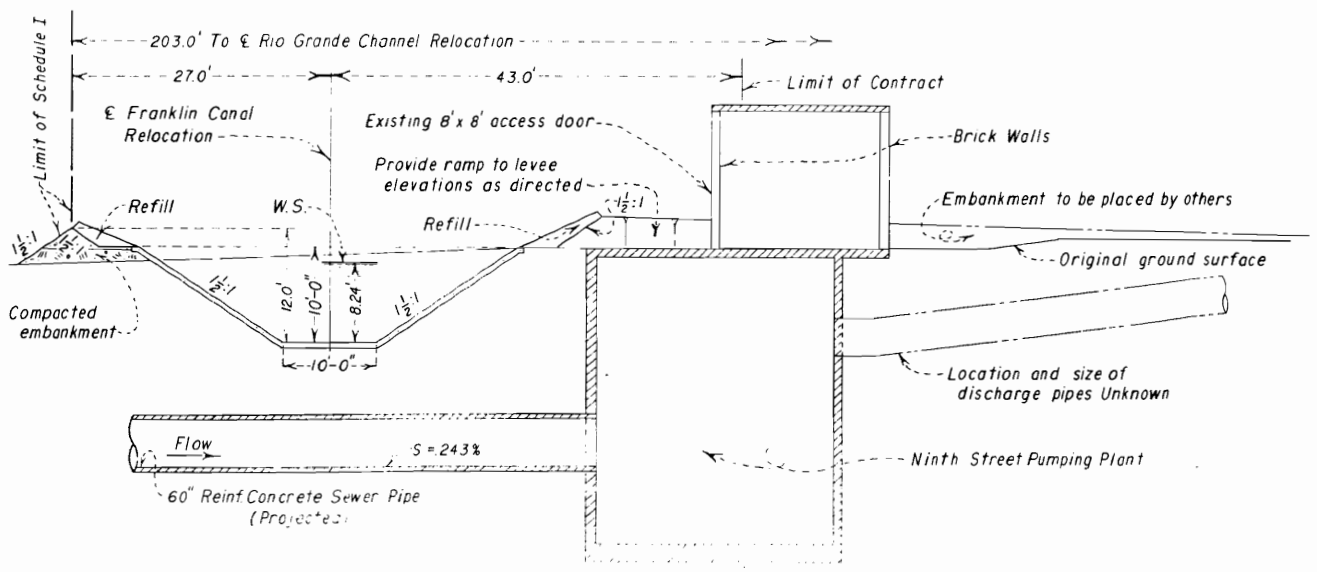
## NOTES

For general notes see 20305 (23-D-531)
For details of joint between concrete lining and structures see Contraction Joint Type B on 20306 (23-D-532)
For details and spacing of safety ladders see 40-D-5927
Transverse contraction grooves shall be @ 15'-0" centers on tangent. Transverse contraction grooves around curves shall be on radial lines @ 15'-0" centers, spaced along the canal centerline.
SP and SP-SM soil material shall be kept moist in canal excavation to prevent sloughing of banks prior to lining placement.
Remove all highly permeable or otherwise unsuitable fill material encountered in canal excavation within 8' of the canal lining and replace with compacted embankment.
The elevation and slope of the right canal bank (levee) shall be as directed.
For location of canal centerline outside of areas shown on typic sections see 20301 (23-D-527) and 20307 (23-D-533)
Stations are approximate and may be adjusted if required after the centerline is established in the field.

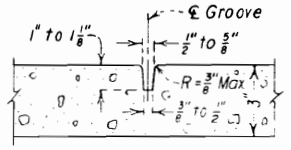



**HYDRAULIC PROPERTIES**

| Q | d | A | V | r | n | S |
|---|---|---|---|---|---|---|
| 1200 | 8.24 | 184.25 | 6.51 | 4.64 | .014 | .000486 |



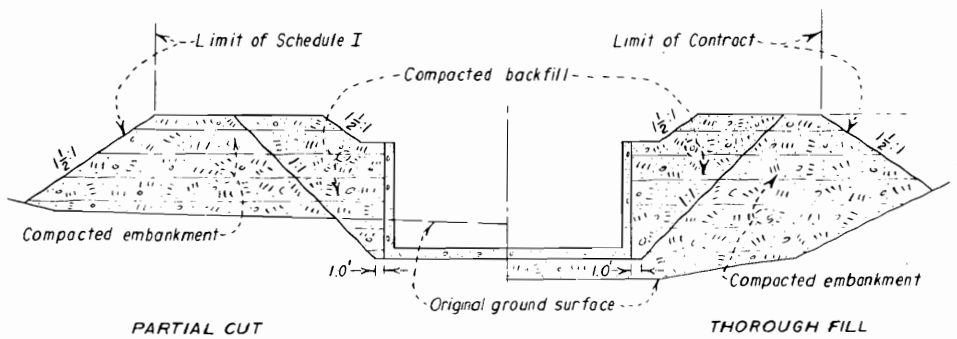

CANAL SECTION AT NINTH STREET PUMPING PLANT




GROOVE DETAIL

**TYPICAL SECTION DIMENSIONS**

| FROM STA | TO STA. | A | B | C |
|---|---|---|---|---|
| 85+00 | 102+58 | 203 | 174 | 47 |
| 102+58 | 104+15 | Dimensions vary | | |
| 104+15 | 124+90 | 195 | 166 | 39 |
| | | | | |
| 140+58 | 145+40 | Dimensions vary | | |
| 145+40 | 165+75 | 210 | 172 | 45 |




TYPICAL EARTHWORK ABOUT TRANSITIONS ON IN-LINE STRUCTURES

| | |
|---|---|
| 8-29-66 | CHANGED ALINEMENT OF CANAL RELOCATION FROM STA. 140+58 TO END. |
| D-7-[illegible] | |

ALWAYS THINK **SAFETY**

UNITED STATES DEPARTMENT OF THE INTERIOR BUREAU OF RECLAMATION

SUBMITTED [illegible] RECOMMENDED [illegible] APPROVED [illegible] CHIEF ENGINEER

INTERNATIONAL BOUNDARY AND WATER COMMISSION
UNITED STATES AND MEXICO
UNITED STATES SECTION
CHAMIZAL CONVENTION PROJECTS

DENVER, COLORADO, MAY 18, 1966

FRANKLIN CANAL RELOCATION

# TYPICAL CANAL AND EARTHWORK SECTIONS

23-D-529

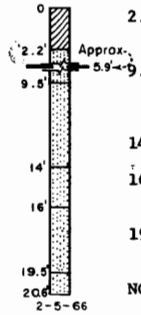
SUBMITTED Aug. 22 1966 APPROVED Aug. 26 1966

[illegible] DESIGNING ENGINEER [illegible] COMMISSIONER

EL PASO, TEXAS

20303

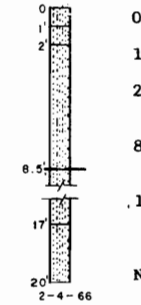
**AP 10**
El. 3703.0




2-5-66

0-2.2' SILT, slightly clayey, very fine sandy 15% , trace plasticity, thin lenses of very fine sand, silty, tan, moist. (ML)
2.2'-9.5' SAND, very fine to fine, trace silt to slightly silty 7% , moderately firm, tan, damp, stratified (observed from visual inspection of hole wall). (SP-SM)
9.5'-14' SAND, very fine to fine, trace gravel (-1"), with few silty clay-balls and seams (-1"); 13'-14', moderately firm, tan, damp (clay is soft and moderately plastic), stratified. (SP)
14'-16' SAND, very fine, slightly silty -10% , moderately firm, tan, damp. (SP-SM)
16'-19.5' SAND, very fine to fine, trace medium, trace gravel (-1"), with few thin lenses of moderately plastic clay, moderately firm, gray, moist. (SP)
19.5'-20.6' SAND, very fine to fine, trace gravel (-2"), moderately firm, tan, and 5" layer of clay, silty, sandy, slightly plastic, moderately soft, brown, moist. (SP-CL)
NOTE: Easy drilling 2.2'-13' and 14'-19.5'; moderately tough drilling 0-2.2', 13'-14', and 19.5'-20.6'. Hole wall not caving. The sand is for the most part subrounded to subangular. The material 0-20.6' represents recent flood plain deposits in the Rio Grande Valley.

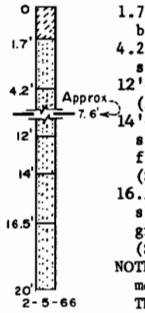
**AP 13**
El. 3702.7




2-4-66

0-1' SAND, very fine, slightly clayey, trace plasticity, dry. (SP-SC)
1'-2' SAND, very fine, slightly silty, moderately plastic, firm, dry. (SP-SM)
2'-8.5' SAND, very fine, silty in layers and several layers of silt, very fine sandy, moderately plastic, firm, tan, dry. Hole wall belled out 2'-8'. (SM-ML)
8.5'-17' SAND, very fine to fine, small amount of gravel (1/2"-3"), moderately firm, tan, damp. Stratified as observed by visual inspection of in-place material. (SP)
17'-20' SAND, very fine to fine, trace silt, moderately firm, tan, and alternating layers of clay, silty, slightly fine sandy to very sandy, moderately plastic, brown, moist. Small amount of gravel mixed with clay and sand. (SP-CL)
NOTE: Easy drilling 1'-17'; moderately tough drilling 0-1' and 17'-20'. Hole wall not caving 8'-20'. The sand is for the most part subrounded to subangular. The material 0-20' represent recent alluvium in the flood plain of the Rio Grande Valley.

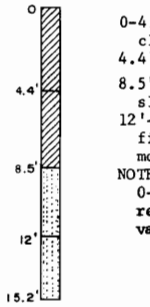
**AP 11**
El. 3703.4




2-5-66

0-1.7' CLAY, silty, some fine sand, with lenses of sand, very fine, silty, clayey, slightly to moderately plastic, tan, dry. (CL)
1.7'-4.2' SAND, very fine, slightly silty, with silt interbeds (three layers 5"-8" thick), moderately firm, tan. (SM)
4.2'-12' SAND, very fine to fine, trace silt to slightly silty 7% , moderately firm, tan, damp, stratified. (SP-SM)
12'-14' SAND, fine to very fine, slightly gravelly (-1") (5%), moderately firm, tan, damp. (SP)
14'-16.5' SAND, fine to medium, slightly gravelly (-1"), slightly clayey -8% , clayey layer 14'-14.5', moderately firm, tan-brown, moist (clay is moderately plastic). (SP-SC)
16.5'-20' SAND, fine to medium, trace coarse; trace to slightly gravelly (-2 1/2") 18'-19', moderately firm, gray; 5" clayey layer at 19', moderately plastic, moist. (SP)
NOTE: Easy drilling 1.7'-14', 14.5'-19', and 19.5'-20'; moderately tough drilling 0-1.7', 14'-14.5', and 19'-19.5'. The sand is for the most part subrounded to subangular. The material 0-20' represents recent alluvium in the flood plain of the Rio Grande Valley.

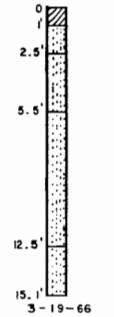
**AP 19**
El. 3702.7




3-19-66

0-4.4' SILT, slightly sandy, very fine, trace clay, few silty clay seams, firm, tan. (ML)
4.4'-8.5' SILT, some sand, very fine, firm, tan, dry. (ML)
8.5'-12' SAND, very fine, slightly silty (5-10%), firm, tan, slightly moist 10'-12'. (SP-SM)
12'-15.2' SAND, very fine, little fine sandy, slightly silty 5% , firm, tan, and clay, silty, fine sandy, in seams up to 8", moderately plastic, firm, brown, moist. (SP-SM and CL)
NOTE: Hole wall did not cave. Moderately firm drilling 0-4.4', 12'-15.2', easy drilling 4.4'-12'. Material 0-15.2' represents recent alluvium in the flood plain of Rio Grande valley. The sand is predominantly subrounded to subangular.

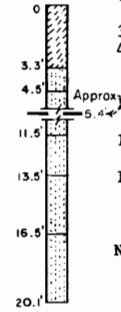
**AP 18**
El. 3703.2




3-19-66

0-1' SILT, slightly sandy, very fine, slightly clayey, trace plasticity, firm, brown, dry. (ML)
1'-2.5' SAND, very fine, slightly silty 12% , firm, tan, dry. (SP-SM)
2.5'-5.5' SILT, slightly sandy, very fine, slightly clayey 5'-5.5', few roots (-1/4"), firm, brown, slightly moist. (ML)
5.5'-12.5' SAND, very fine, slightly silty 7% , firm, tan, slightly moist. (SP-SM)
12.5'-15.1' SAND, very fine to fine, trace medium, slightly gravelly (-1") (10%), firm, tan, slightly moist. (SP)
NOTE: Hole wall did not cave. Moderately firm drilling 0-5.5', easy drilling 5.5'-15.1'. Material 0-15.1' represents recent alluvium in flood plain of Rio Grande valley. The sand is predominantly subrounded to subangular.

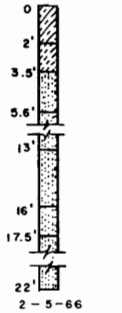
**AP 14**
El. 3701.4




2-4-66

0-3.3' CLAY, silty, slightly fine sandy, limy, moderately plastic, firm, brown, damp. (CL)
3.3'-4.5' SAND, very fine, silty 15% , soft, tan. (SM)
4.5'-11.5' SAND, very fine, some fine 8'-11.5', scattered gravel (-2 1/2"), 11'-11.5', slightly silty 7% , moderately firm, tan, damp; stratified. (SP-SM)
11.5'-13.5' CLAY, slightly fine sandy, moderately plastic, moderately firm, brown, moist. (CL)
13.5'-16.5' SAND, very fine to fine, trace silt, moderately firm, tan, damp. (SP)
16.5'-20.1' SAND, very fine to fine, some medium 16-17' scattered gravel (-1"), modcrately firm, tan; and silty clay seam (-3") at 16', 17', 19', and 20', moderately plastic, soft, brown, moist. (SP)
NOTE: Hole wall not caving. The material 0-20.1' represents recent alluvium in the flood plain of Rio Grande Valley. Moderately tough drilling 0-3.3' and 11.5'-13.5'; easy drilling 3.3'-11.5' and 13.5'-20.1'. The sand is for the most part subrounded with little subangular.

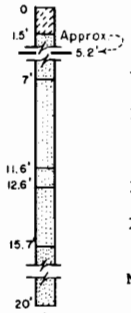
**AP 12**
El. 3704.2




2-5-66

0-2' CLAY, SILT, and small amount of gravel, firm. (Fill) (CL)
2'-3.5' CLAY, very silty, slightly fine sandy, thin lenses of silty sand, moderately firm, slightly plastic, brown, damp. (CL)
3.5'-5.6' SAND, very fine to fine, silty, with lenses of silt, slightly fine sandy, moderately soft, tan-brown, damp. (SM)
5.6'-13' SAND, very fine, moderately firm, tan, damp, stratified. (SP)
13'-16' SAND, very fine to fine, trace medium and coarse, trace silt, gravelly layers, moderately firm, tan, damp. (SP)
16'-17.5' SAND, very fine to fine, trace silt, moderately firm, tan, damp. (SP)
17.5'-22' SAND, very fine to fine, slightly silty, gravelly (-1"), 17.5'-18' moderately firm, tan, damp. (SP-SM)
NOTE: Moderately tough drilling 0-3.5', easy drilling 3.5'-22'. Hole wall not caving. The sand is for the most part subrounded to subangular. The material 2'-22' represents recent alluvium in the flood plain of the Rio Grande Valley.

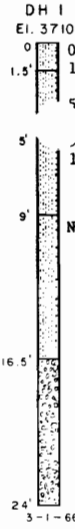
**AP 15**
El. 3701.0




2-3-66

0-1.5' CLAY, silty, slightly very fine sandy, moderately plastic, firm, brown. (CL)
1.5'-7' SAND, very fine to fine, trace silt, few silty seams (-3"), moderately firm, tan; some manganese sand 5.5'-5.7'. (SP-SM)
7'-11.6' SAND, fine, some very fine, trace gravel (-1"), moderately firm, tan. (SP)
11.6'-12.6' SAND, very fine to fine with 0.3' layer of clay, silty, moderately plastic, mixed with gravelly sand, moderately firm, tan, brown, moist. (Gravel 3/4") (SC-CL)
12.6'-15.7' SAND, very fine, slightly silty -5% , moderately firm, tan. (SP)
15.7'-20' SAND, very fine to fine, slightly silty, with three lenses of silty clay 15.7'-18.7', moderately firm, tan, moist. (SP-SM)
NOTE: Hole wall not caving. The material 0-20' represents recent alluvium in the flood plain of Rio Grande Valley. Moderately tough drilling 0-1.5'; easy drilling 1.5'-20'. The sand is for the most part subrounded to subangular.

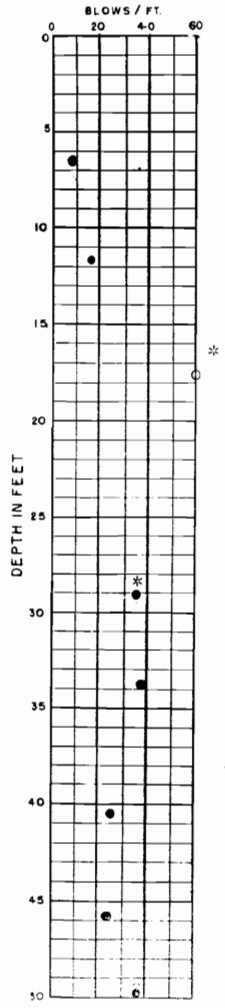
**DH 1**
El. 3710.4



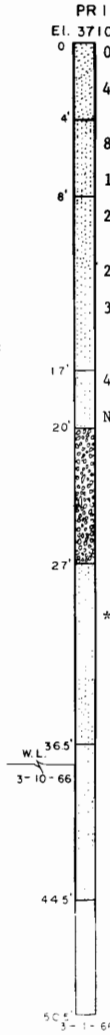

3-1-66

0-1.5' SAND, very fine, silty, soft, tan. (Fill)
1.5'-5' SAND, very fine, silty, with layers of SILT, fine sandy, soft, tan. (SM)
5'-9' SAND, very fine, slightly silty, few silty seams, moderately firm, tan-brown. (SP-SM)
9'-16.5' SAND, very fine, trace silt, firm, tan. (SP)
16.5'-24' GRAVEL, (-2", few -3"), sandy, with layers of sand, very fine to fine, little medium to coarse, gravelly, few clayey seams, firm, tan. (GP)

NOTE: Used 7 7/8" tricone rockbit and heavy mud 0-5', 7-10', 11.6'-15.9', 17.7'-24'; 6" Denison-type barrel with metal liner dipped in flex-a-lin 5'-7', 10'-11.6', 15.9'-17.7'. Smooth, moderately fast penetration without hydraulic pressure at slow rotation 0-5', 7'-10', 11.6'-15.9'; slight hydraulic pressure 5'-7', 10'-11.6', 15.9'-16.5'; rough slow penetration with slight hydraulic pressure 16.5'-24'. Sample blocked in liner at 7', 11.6', 17.7'. Gravel blocked and wedged in liner, no penetration at 20'. Rough drill action indicated medium-size gravel 20'-24'. Hole caved 18'-24'. Gravel did not wash out. Rockbit was binding. Logged from cuttings, drilling characteristics, and visual inspection of exposed ends of samples. Sampled intervals preserved in metal liners for testing; 5.0-6.6'
10.1-11.2'
16.2-17.1'




**PR 1**
El. 3710.4

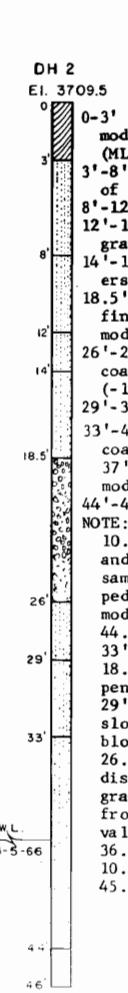



3-1-66

0-4' SAND, very fine, silty, with 0.5' layers of silt and slightly plastic silty clay, soft, brown, tan, dry. (SM)
4'-8' SAND, very fine, slightly silty 10% , few slightly plastic silty clay seams (1"), moderately firm, tan, dry. (SP-SM)
8'-17' SAND, very fine to fine, trace silt, firm, tan, damp. (SP)
17'-20' SAND, very fine to fine, little medium and coarse gravel (-1") (20%), firm, tan, damp. (SP)
20'-27' GRAVEL, (-1 1/2", few 3") ( 60%), and SAND, very fine to fine, some medium and coarse in parts 40% , firm, tan. (GP)
27'-36.5' SAND, very fine, little fine, trace gravel (-3/4"), firm, tan, moist. (SP)
36.5'-44.5' SAND, very fine to fine, some medium and coarse in parts, slightly gravelly to gravelly (-1 1/2", few -3"), (25%) 36.5'-38.5', 40.5'-44.5', few clay-balls (-3"), firm, brown, tan, wet. (SP-GP)
44.5'-50.5' SAND, very fine to fine, trace silt to slightly silty 7% , very firm, tan, wet. (SP-SM)
NOTE: Set NX casing to 27', 39', 43'. Drilled without using hydraulic pressure at moderate rotation speed. Used 3" drag bit and air 0-16.5', drilling mud 16.5'-28'; NX rock bit and drilling mud 28'-50.5'. Fast penetration 0-20', 27'-28'; 28'-36.5'; 44.5'-50.5'; slow penetration 20'-27', 36.5'-44.5'; rough drilling 20'-27', 36.5'-44.5'. Caved 36'-38.5', 40'-43', 43.5'-44.5'; lost 50 gallons drill mud 20'-27'. Logged from visual inspection of penetration resistance samples, wash-bore and air cutting and drilling characteristics.

*Rock wedged in barrel 16.5'-17'--10 blows; 3/4" gravel, top sample, 28'-28.5'--15 blows; 1 3/8" gravel wedged in top 49.5'-50'--14 blows.

**DH 2**
El. 3709.5




3-5-66

0-3' SILT, very fine sandy, with thin layers of silty sand and moderately plastic silty clay, moderately firm, brown, dry. (ML)
3'-8' SAND, very fine, slightly silty 10% , with thin layers of very fine sandy silt, moderately firm, tan, dry. (SP-SM)
8'-12' SAND, very fine, trace silt, firm, tan, damp. (SP)
12'-14' SAND, very fine, little fine, medium and coarse, gravelly (-2"), firm, tan. (SP-GP)
14'-18.5' SAND, very fine, trace gravel (-1") in few thin layers, firm, tan. (SP)
18.5'-26' GRAVEL (-1 1/2" few -2 1/2") with some sand, very fine to fine, little medium and coarse, few clayey seams, moderately firm to firm, tan. (GP)
26'-29' SAND, very fine to fine, some medium in parts, little coarse, gravelly (-3/4") 26.5'-28', slightly gravelly (-1/2") (10%) 28'-29', firm, tan. (SP-GP)
29'-33' SAND, very fine, trace silt, firm, tan. (SP)
33'-44' SAND, very fine, little fine, some medium and little coarse associated with layers of gravel (-1") 33'-34', 37'-44', few moderately plastic silty clay seams (-3"), moderately firm to firm, tan. (SP-GP)
44'-46' SAND, very fine, trace silt, firm, tan. (SP)
NOTE: Air-drilled with 7 7/8" tricone rockbit 0-3', 5.2'-10.2', 12.4'-15 1/2'; wash bored with moderately heavy mud and 7 7/8" rockbit 16.5'-26.5', 32'-35.5', 36.7'-44.5'; sampled with 6" Denison-type barrel with metal liner (dipped in flex-a-lin) using air 3'-5.2', 10.2'-12.4'; used moderately heavy mud 15'-16.5', 26.5'-32', 35.5'-36.7', 44.5'-46'. Smooth fast drilling 0-12', 14'-18.5', 29'-33', 44'-46'; rough moderately slow drilling 12'-14', 18.5'-26', 33'-44'; slightly rough with moderately fast penetration 26'-29'. Hole caved 8'-15'; belled out 18.5'-29'; 5' of caved material in hole at 36.7'. Rotated bit slowly with moderate hydraulic pressure 33'-44'. Sample blocked in liner at 16.5', 30.7', 36.7', 45', 46'. Samples 26.5'-28.2', 28.2'-29.2', 29.2'-30.7', 35.5'-36.7' were disturbed and discarded (saturated with drilling mud in gravelly zones.) No sample recovered 30.7'-32'. Logged from visual inspection of exposed portion of sampled intervals and drilling characteristics 0-26.5', 30.7'-35.5', 36.7'-44.5'. Samples for testing: 3.2'-4.9' (air-drilled) 10.3'-12.1' (air-drilled) 15.2'-16.2' (absorbed moisture) 45.1'-45.7' (slightly disturbed).

NOTE
For explanation and additional note, see Dwg. 2031I (23-D-556)

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INTERNATIONAL BOUNDARY AND WATER COMMISSION
UNITED STATES AND MEXICO
UNITED STATES SECTION
CHAMIZAL CONVENTION PROJECTS

FRANKLIN CANAL RELOCATION

LOGS OF EXPLORATION

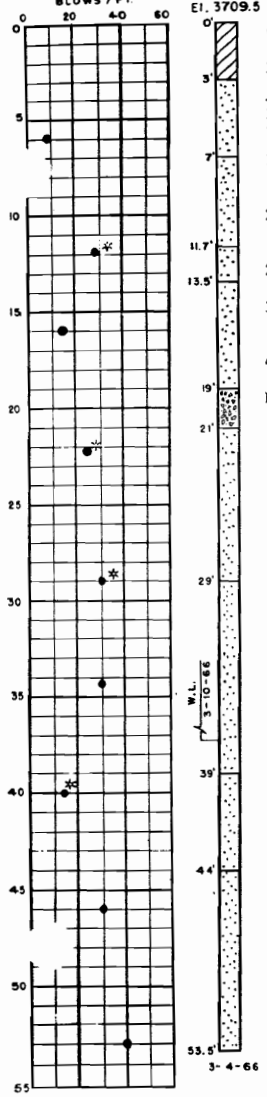
UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

DRAWN: R.T.S. - C.M.B. -- SUBMITTED: [signature] CHIEF, ENGINEERING DIVISION
TRACED: J.S.T.M. -- RECOMMENDED: [signature] CHIEF, DESIGN BRANCH
CHECKED: E.F.C. -- APPROVED: [signature] CHIEF ENGINEER
DENVER, COLORADO, MAY 18, 1966
SHEET 2 OF 4

23-D-557

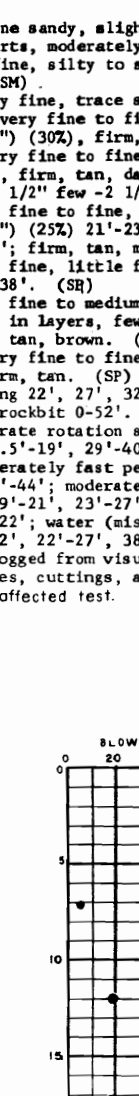
SUBMITTED: Aug. 26, 1966 APPROVED: Aug. 26, 1966
[signature] PRINCIPAL ENGINEER [signature] COMMISSIONER

EL PASO, TEXAS 20312

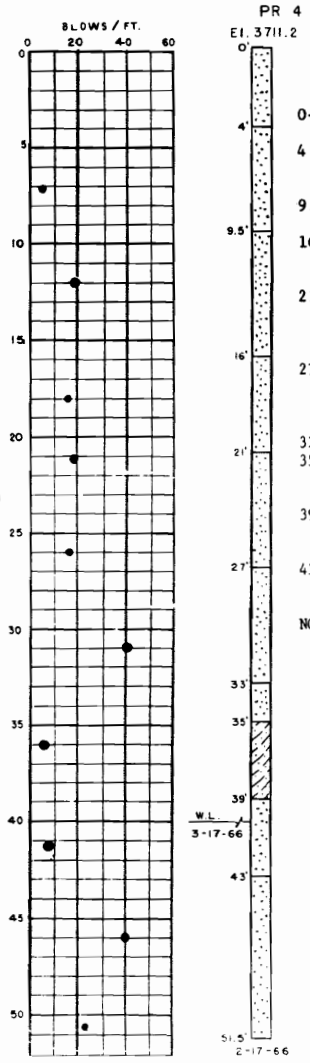



PR 2
El. 3709.5

0-3' SILT, very fine sandy, slightly clayey layers, trace plasticity in parts, moderately firm, tan, dry. (ML)
3'-7' SAND, very fine, silty to slightly silty, moderately firm, tan. (SP-SM)
7'-11.7' SAND, very fine, trace silt, firm, tan, damp. (SP)
11.7'-13.5' SAND, very fine to fine, little medium and coarse, gravelly (-1 1/2") (30%), firm, tan. (SP-GP)
13.5'-19' SAND, very fine to fine, silty seam 15.2'-15.3', few gravel (-1"), firm, tan, damp. (SP)
19'-21' GRAVEL (-1 1/2" few -2 1/2"), sandy, firm, tan. (GP)
21'-29' SAND, very fine to fine, little medium and coarse, gravelly (-1 1/2") (25%) 21'-23', 27'-29'; much gravel (-1 1/2") 23'-27'; firm, tan, moist. (SP-GP)
29'-39' SAND, very fine, little fine, trace silt, firm, tan, moist to wet at 38'. (SP)
39'-44' SAND, very fine to medium, little coarse, slightly gravelly (-1/2") in layers, few plastic clay layers (-2"), moderately firm, tan, brown. (SP)
44'-53.5' SAND, very fine to fine, trace silt, scattered gravel (-2"), firm, tan. (SP)
NOTE: Set Nx casing 22', 27', 32', 42', 47'. Air-drilled with Nx tricone rockbit 0-52'. Drilled without hydraulic pressure at moderate rotation speed. Smooth, fast penetration 0-11.7', 13.5'-19', 29'-40', 44'-53.5'; slightly rough drilling and moderately fast penetration 11.7'-13.5', 21'-23', 27'-29', 40'-44'; moderately slow penetration with rough drilling 19'-21', 23'-27'. Lost estimated 75% air circulation 13'-22'; water (mist) blown from hole 38'-53.5'. Hole caved 12'-22', 22'-27', 38'-44'; 1' of cave with hole open 47'-52'. Logged from visual inspection of penetration resistance samples, cuttings, and drilling characteristics. *Gravel may have affected test.

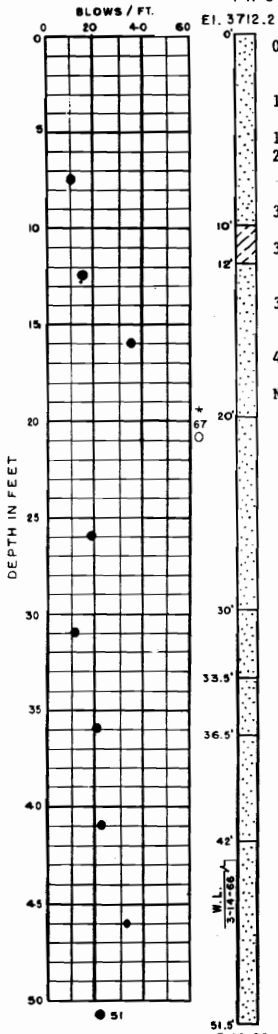



0-10' SAND, very fine, silty, with mixture of clay, silt, gravel, ashes, and brick debris, moderately firm with soft pockets at 5' and 9', tan, black, dry. (Fill)
10'-12.5' SAND, very fine, moderately firm, tan, 4" layer of silty clay, moderately plastic, brown, soft. (SP-CL)
12.5'-18' SAND, very fine, trace silt, firm, tan. (SP)
18'-30' SAND, very fine to fine, little medium and coarse, slightly gravelly to gravelly (-1-1/2" few -3") in part 35% , scattered clayey layers (-2"), moderately firm to firm, tan. (SP-GP)
30'-33.5' SAND, very fine, slightly silty 5%, moderately firm, tan. (SP-SM)
33.5'-35' SAND, very fine to fine, little medium to coarse in part, gravelly (-2") layers, firm, tan. (SP)
NOTE: Wash bored with 7 7/8" tricone rockbit 0-5', 7'-10.3', 17.2'-20', 22.2'-25', 27'-31' using moderately heavy drill mud, slight hydraulic pressure and slow to moderate bit rotation 0-18'; slow rotation 18'-31'. Sampled with 6" Denison-type barrel and metal liner (dipped in flex-a-lin) 5'-7', 10.3'-17.2', 20'-22.2', 25'-27', 31'-35'; drilled at moderate rotation speed and moderate hydraulic pressure. Smooth to rough drilling and moderately slow penetration 0-10'; smooth, fast penetration 10'-18', 30'-35'; rough, slow drilling with 7 7/8" rockbit 18'-30'; rough and moderately fast with 6" Denison 18'-30'. Circulation lost momentarily at 5' and 9.5'; estimated loss 15 gpm. Hole caved 22'-25', 25'-31', 1' caved material in hole at 33'; unable to wash gravel out of hole 33'-35' - hole belled out. Drill mud loss estimated ~5 gpm 25'-33'. No mud loss by gravity flow. Samples 5'-7', 10.3'- 12.5', 12.5'-14.1', 14.1'-15.2', 31'-32' were disturbed and discarded; samples dropped in hole 25'-26', 26' to 27'; blocked in liner at 14.1', 15.2', 26', 27', 32'.
**Samples preserved for testing: 15.7'-16.9', 20.8'-21.8' (absorbed moisture, slightly disturbed around edge) 32.1'-32.8', 33.4'-34.7'. Logged from visual inspection of exposed portions of sampled intervals and interpretation of drilling characteristics 0-5', 15.2'-31', 32'-35'. Unable to wash gravel out of hole - abandoned at 35'.**



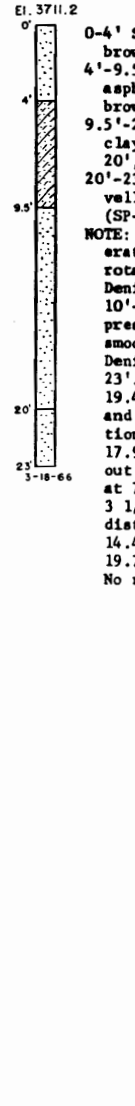

PR 4
El. 3711.2

0-4' SAND, slightly silty, with some gravel (-2 1/2"), soft, brown. (Fill)
4'-9.5' SAND, SILT, and some CLAY, with ashes and asphalt in the lower portion, moderately firm to soft, tan-brown black. (Fill)
9.5'-16' SAND, very fine, moderately firm to soft 13.5'-16', tan, slightly moist. (SP)
16'-21' SAND, very fine, little fine, with trace medium and coarse in gravelly thin layers, moderately firm with soft plastic clay seams (-1 1/2") at 17', tan, damp. (SP)
21'-27' SAND, very fine to fine, little medium and coarse with gravel (-1") (30%) in parts, firm, tan; and 3" layer of clay, silty, mixed with gravel at 25.5', tan-brown, moist. (SP-GP)
27'-33' SAND, very fine, little fine, trace medium and coarse, slightly gravelly to gravelly (-1") (20%) 30'-32'; scattered soft plastic clay seams (-2"), firm, tan-brown, moist. (SP-GP)
33'-35' SAND, very fine, soft, tan. (SP)
35'-39' CLAY, silty, sandy, with very fine SAND in thin seams, grades to alternating layers of sand and clay, moderately plastic, soft, brown, moist. (CL)
39'-43' SAND, very fine, slightly silty, gravelly (-2") 39'-40', few silty clay seams, soft to moderately firm, gray-tan, saturated. (SM)
43'-51.5' SAND, very fine to fine, little medium and coarse, slightly gravelly (-1") to gravelly (-2") (~50%) in parts, firm, gray-tan, saturated. (SP-GP)
NOTE: Set Nx casing 17', 27'. Air-drilled with 3" drag bit 0-17'; wash bored with moderately heavy mud and Nx tricone rockbit 17'-50'. Drilled without hydraulic pressure and moderate rotation 0-50'. Smooth, fast drilling 0-13.5'; very fast drilling 13.5'-16'; slightly rough in parts and fast drilling 16'-21'; rough in parts and moderately fast drilling 21'-23'; rough and moderately slow drilling 43'-50'. Logged from visual inspection of penetration resistance samples, cuttings, and drill action. Hole caved 13.5'-16', 22'-25'. Lost air circulation 13.5'-16'. Partial loss of drilling mud 42'-50' - estimated 5 gpm; no loss under gravity flow.

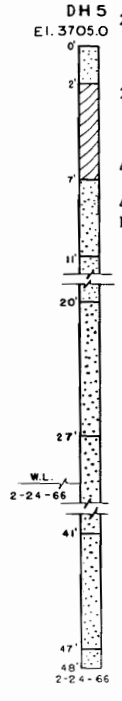



PR 3
El. 3712.2

0-10' SAND, very fine, silty with mixture of clay, silt, ashes, and brick debris, soft to moderately firm, brown-tan, dry. (Fill)
10'-12' CLAY, silty, sandy, moderately plastic; with layers of SILT and silty SAND, soft, brown-tan, dry. (CL-ML)
12'-20' SAND, very fine, trace silt, firm, tan. (SP)
20'-30' SAND, very fine to fine, little medium and coarse, slightly gravelly to gravelly (-1 1/2" few -3") (35% ), few clayey layers (-2"), moderately firm to firm, tan. (SP-GP)
30'-33.5' SAND, very fine, slightly silty 5% , moderately firm, tan. (SP-SM)
33.5'-36.5' SAND, very fine to fine, little medium to coarse, gravelly (-2") layers, few layers (-1") of soft, moderately plastic silty clay, firm, tan-brown. (SP)
36.5'-42' SAND, very fine to fine, trace gravel (-1/2"), moderately firm to firm, tan; and 41-41.3' CLAY, silty, moderately plastic, soft, brown. (SP)
42'-51.5' SAND, very fine, trace medium, gravel (-3/4")(20%), moderately firm to firm, gray-tan. (SP)
NOTE: Set NX casing 10', 20', 30'. Air-drilled with NX tricone rockbit 0-10'; wash bored with NX tricone and heavy mud 10'-50'. Drilled without hydraulic pressure at moderate rotation 0-50'; smooth, fast drilling 0-20', 30-50'; rough slow drilling 20'-30'. Hole caved 7'-9.5', 12'-16.5', 17'-21.2', 25'-30' after penetration resistance tests. Partial loss of air flow at 10'. Slight loss of drill mud 20'-30', estimate 5 gpm.; no mud loss by gravity flow. Penetration resistance samples moist to 41.5', wet at 45'. Est. water level 43' 3-14-66. Logged from visual inspection of penetration resistance samples, air- and wash-bore cuttings, and drilling characteristics. *Large gravel wedged in barrel at 21'. 20.5-21' with 20 blows. Interpreted 40 blows per foot




0-4' SAND, slightly silty, with some gravel -2 1/2", soft, brown, dry. (SM-GM) (Fill)
4'-9.5' SAND, SILT, and little CLAY, with ashes, cinders, and asphalt in the lower portion, moderately firm to soft, tan, brown, black. (Fill)
9.5'-20' SAND, very fine, little fine, with few soft plastic clay seams (-1 1/2") 17'-20', slightly gravelly (-1") 17'-20', moderately firm to soft 13.5'-16'. (SP)
20'-23' SAND, very fine to fine, trace medium, slightly gravelly (-2 1/2") (~10%), becoming gravelly (30%) 22'-23'. (SP-GP)
NOTE: Wash bored with 7 7/8" tricone rockbit 0-10' using moderately heavy drill mud, slight hydraulic pressure and rotating bit slowly to moderately fast. Sampled with 6" Denison-type barrel with metal liner (dipped in flex-a-lin) 10'-23' using moderate rotation speed and moderate hydraulic pressure. Slightly rough, moderately fast drilling 0-4'; smooth, slow drilling 4'-10'; smooth fast drilling with 6" Denison barrel 0-20'; rough, moderately slow drilling 20'-23'. Samples preserved for testing: 13.2'-14.1', 18.2'-19.4'. Logged from interpretation of drilling characteristics and wash bore cuttings 0-10', 20.7'-23'; from visual inspection of exposed portions of sampled intervals 13'-14.4', 17.9'-19.7'. Unable to wash gravel out of hole, hole belled out 7'-16'. Abandoned at 23'. Lost circulation momentarily at 7' and 13.5'. Estimated loss 10 gpm. Hole caved 7'-10'; 3 1/2' of caved material in hole at 23'. Samples 12.2'-13' disturbed and discarded. Samples blocked in liner repeatedly 14.4'-17.9'. Unable to recover undisturbed samples. Sample 19.7'-20.7' blocked in liner - was disturbed and discarded. No recovery with 6" Denison 20.7'-23'.




0-2' SAND, silty with gravel and some brick pieces. (Fill)
2'-7' SILT, very fine sandy, and SAND, very fine, slightly silty, moderately firm, tan. (ML-SM)
7'-11' SAND, very fine, slightly silty, moderately firm, tan, damp. (SP-SM)
11'-20' SAND, very fine, slightly silty seams, stratified, moderately firm, tan. (SP)
20'-27' SAND, very fine to fine, few slightly silty seams, gravelly (1/4"-1 1/2", few -3") with few clay-balls 20'-20.6', 23.8'-24.1', 24.7'-25', 25.8'-26', 26.5'-27', moderately firm, tan. (SP)
27'-41' SAND, very fine to fine, little medium, trace silt, few scattered seams of gravel (-1") with clay-balls, gravelly (-1") with clay-balls 36'-37', firm, tan, wet at 29'. (SP)
41'-47' SAND, fine to medium, little coarse, gravelly (-1 1/2", few -3") in layers (~0.5'), firm, brown-tan. (SP)
47'-48' SAND, very fine to fine, firm, gray, wet. (SP)
NOTE: Material 2'-48' represents recent alluvium in flood plain of Rio Grande Valley. Used 6 1/4" tricone rockbit 0-5', 7.2'-9', 10.5'-13.5', 17.5'-19'; 6" Denison-type barrel without liner 22.6'-24.5', 26.8'-29', 31.5'-34.4', 36.5'-38.5', 42'-45'; 6" Denison-type barrel with metal liner (dipped in flex-a-lin) 5'-7.2', 9'-10.5', 13.5'-17.5', 19'-22.6', 24.5'-26.8', 29'-31.5', 34.4'-36.5', 38.5'-42', 45'-48'. Liner crumbled and disturbed samples 15.5'-16.5', 16.5'-17.5', 19'-20.6'; sample blocked in liner at 25.5', 26.8', 31.5', 41', 42', 45.5', 46.5', 48'. Dropped sample 41'-42', 45.5'-46.5', 46.5'-48'. Drilling characteristics: Easy drilling with tricone rockbit 0-19'. Moderately fast penetration with 6" Denison 0-15.5'; smooth, moderately slow drilling with 6" Denison 15.5'-20', 20.6'-23.8', 27'-41'. (Sample did not block in barrel at intervals where liners were not used except in gravelly zones at 43', 44', 45'). Very difficult penetration 41'-48'. No recovery 41'-42', 43'-48'. Rough drilling 20'-20.6', and in layers (0.6") 23.8'-27', 41'-47'.
Logged from visual inspection of exposed portions of sampled intervals and interpretation of drilling characteristics 0-22.6', 24.5'-26.8', 29'-31.5', 39'-48'. All samples above water table absorbed some moisture; samples below 30' well saturated. Hole walls were maintained open with moderately heavy mud. Samples for testing: 5.2'-6.7', 9.2'-10', 13.9'-15.1', 20.9'-22.1', 24.7'-25.3', 25.8'-26.8', 30.2'-31.1', 34.6'-36', 39'-40.1'.

**NOTE**

For explanation and additional note, see Dwg 20311 (23-D-556).

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UNITED STATES SECTION
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FRANKLIN CANAL RELOCATION

LOGS OF EXPLORATION

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

DRAWN A.T.S. C.S.B. SUBMITTED
TRACED J.R.V. RECOMMENDED
CHECKED APPROVED
DENVER, COLORADO, MAY 18, 1966
SHEET 3 OF 4

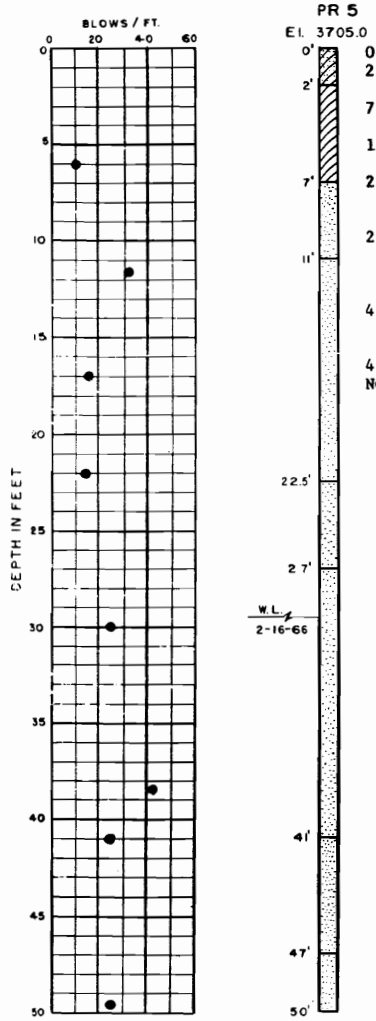
23-D-558

SUBMITTED Aug. 26, 1966 — APPROVED Aug. 26, 1966

W. E. Walker, PRINCIPAL ENGINEER — [illegible], COMMISSIONER

EL PASO, TEXAS

20313




PR 5

El. 3705.0



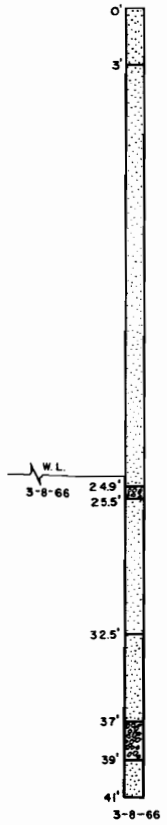

0-2' SAND and SILT with gravel and pieces of brick. (Fill)
2'-7' SILT, very fine sandy and silty sand layers, moderately firm, brown. (ML-SM)
7'-11' SAND, very fine, slightly silty layers, moderately firm, tan. (SP-SM)
11'-22.5' SAND, very fine, little fine, trace gravel (-2 1/2"), few clay-balls in few thin layers, firm, tan, damp. (SP)
22.5'-27' SAND, very fine to fine, little medium and coarse, few silty seams, some gravel (-1 1/2", few -3") (25%) in layers (-0.5'), few clay-balls, firm, brown. (SP-GP)
27'-41' SAND, very fine to fine, slightly silty in thin seams, scattered gravel and few clay-balls (-1", few -3"), with gravelly and clayey mixture 36'-37', firm, brown, wet at 30'. (SP)
41'-47' SAND, very fine to fine, little medium to coarse in parts, gravelly (-1 1/2", few -3") in layers (-0.5') at 41', 42', 44', and 45', firm, brown, wet. (SP-GP)
47'-50' SAND, very fine to fine, firm, gray, wet. (SP)
NOTE: Used 3' Nx casing, dry barrel and Nx sawtooth bit 0-21'; drag bit and drilling mud 21.5'-50' without hydraulic pressure at moderate rotation speed. Moderately firm drilling 0-21'; fast penetration 21'-22.5', 27'-41', 47'-50'; moderately slow 22.5'-27', 41'-47'; rough drill action 22.5'-27', 41'-47'; smooth drill action 29'-41', 47'-50'. Hole opened by jetting 27'-29'. Logged from visual inspection of PR samples, wash-bore cuttings, and drilling characteristics 21'-50'. Hole caved 42'-50'. Water level measured at DH5 2-16-66.

Water Test #1 on 2-11-66,
(10' South- AP # 1)
El. 3707.1
0-10' CUTTINGS, sand, very fine, some silt, few clay lenses. TEST PROCEDURE, filled hole with water and kept it full for ten minutes before timing test. Water take was rapid at first, but slowed to small take after a few minutes. Checked hole to be sure it was open before timing test. Test hole took 5 qts. of water in 5 minutes.
NOTE: 3" fishtail bit-drilled with air.
0'-20' Deepened hole to 20'. Repeated test (0-20'). Test hole took 10 quarts of water in 5 minutes.
NOTE: 3" fishtail bit-drilled with air.

Water Test #2 on 2-11-66,
(10' West- AP # 5)
El. 3703.8
0-10' Cuttings, sand, very fine, few thin clay and silt lenses. Test procedure, filled hole with water and kept it full for 10 minutes. Checked depth of hole to be sure it was open. Measured water take for 5 minutes. Test, hole took 25 quarts in 5 minutes.
NOTE: Found it necessary to leave drill rod in hole and rotate it slowly in order to keep hole open, 3" fishtail bit, drilling with air.
10'-20' Deepened hole to 20', but could not keep hole open below 15' even with drill rod turning in hole during test. Unsuccessful test at 15'. Took 2 qts. of water in 5 minutes - wet cuttings from clay seams had scaled off the walls of the hole.
NOTE: 3" fishtail bit, drilling with air.

DH 6

El. 3699.2

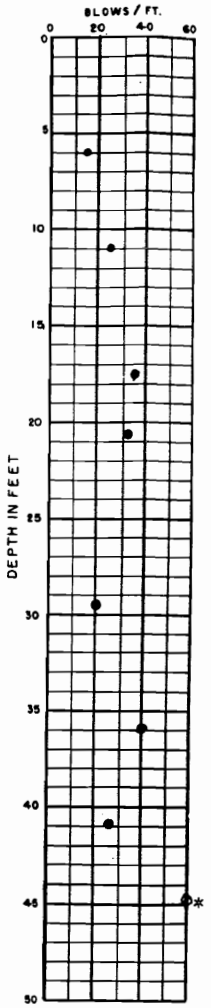



0-3' SAND, very fine, silty, trace gravel (-1"), soft, tan, dry. (SM)
3'-24.9' SAND, very fine, some fine with little medium, trace of gravel (-1/2") in scattered thin layers, few small balls of plastic clay 20'-24.9', moderately firm to firm 15'-24.9', tan, dry to slightly moist 10'-17', moist 17'-24', wet at 24'. (SP)
24.9'-25.5' GRAVEL (-1 1/2"), sandy, moderately firm, tan. (GP)
25.5'-32.5' SAND, very fine to fine, little medium, trace gravel, moderately firm, dark gray, gray, wet. (SP)
32.5'-37' SAND, fine, some very fine, little medium and coarse, slightly gravelly to gravelly (-1 1/2") in layers, few clay-balls, tan, gray, wet. (SP-GP)
37'-39' GRAVEL (-2") (some limy coated), sandy, trace clay, firm, tan, gray. (GP)
39'-41' SAND, very fine to fine, little medium and coarse, slightly gravelly to gravelly (50%) in layers, few clayey thin layers, firm, tan, gray. (SP-GP)
NOTE: Air drilled with 7 7/8" tricone rockbit 0-5', 7'-10', 12'-15'. Wash bored with moderately heavy mud and 7 7/8" rockbit 17'-20', 22'-26', 28.7'-30', 31.4'-39'; sampled with 6" Dension barrel and metal liner (dipped in flex-a-lin) using air 5'-7', 10'-12'; used moderately heavy mud 15'-17', 20'-22', 26'-28.7', 30'-31.7', 39'-41'. Used slight hydraulic pressure and slow rotation 0-41' with rockbit. Smooth, moderately slow penetration 0-5', 7'-10', 12'-24.9', 25.5'-32.5'; rough, slow penetration 24.9'-25.5', 32.5'-37'; smooth, fast penetration with Denison barrel 5'-7', 10-12'. Hole caved and belled out 10'-15'; caved 32'-41'; mud thinned out in gravelly zone and lost estimated 5 gpm. Unable to maintain open hole 32'-41'. Sample blocked in liner at 27.3', 31.4', 38.7'. Sample 26'-27.3' was disturbed and discarded; sample 39.8'-40.7' is slightly disturbed around edges. Logged from visual inspection of exposed portions of sampled intervals and interpretation of drilling characteristics 0-26', 27.3'-41'. Samples preserved for testing: 5.7'-6.7' (air drilled), 10.8'-11.7' (air drilled), 15.8'-16.7', 20.8'-21.7' (absorbed moisture), 27.4'-28.4' (absorbed moisture), 30'-31.1' (absorbed moisture), 39.8'-40.7' (slightly disturbed). Used moderate hydraulic pressure and slow rotation. Water level measured at PR 6 3-8-66.

Water Test #2 on 2-15-66
(6' West- AP #5
El. 3703.8
0-20' Placed 20' of perforated 1 1/2" pipe in hole to keep it open. (1) Filled hole with water, it required 20 minutes at 12-15 gpm to fill hole. (2) Kept hole full for 10 minutes. (3) Tested for 5 minutes - took 11 gpm.
NOTE: 3" fishtail bit - drilled with air.

Water Test #3 on 2-12-66
(Adjacent to AP #10)
El. 3703.0
0-10' Could not test - drilled to 20' with air. When filled with water - hole caved in. When cleaned out, drill rod stuck in hole due to caving. Worked 3 hours - unable to test open hole. Will need perforated pipe for testing.
NOTE: 3" fishtail bit - drilled with air - fine sand with silt and clay lenses.

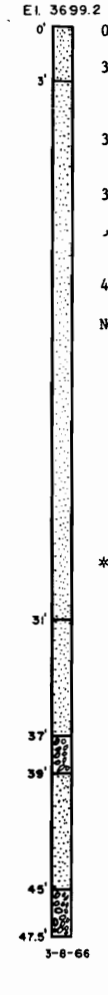
Water Test #3 on 2-15-66
(Adjacent AP #10)
El. 3703.0
0-10' Test Procedure, placed 10' of perforated 1 1/2" pipe in hole to keep hole open. Filled with water (took quite a bit) and kept full for 10 minutes, then timed take for next 5 minutes. Test hole took 40 qts. of water in 5 minutes.
NOTE: 3" fishtail bit - drilled with air. Cuttings - fine sand, trace of clay.
0-20' Test procedure, same as above. Test hole took 18 qts. of water in 5 minutes.
NOTE: Reason for reduced volume of take would probably be due to walls of hole being sealed off by coating of wet clay when hole was deepened. 3" fishtail bit - drilled with air. Deepened hole to 20'.




Water Test #4 on 2-15-66
(Adjacent AP #13)
El. 3702.7
0-10' (1) Took 25 minutes to fill hole with water at 10-12 gpm.
(2) Kept hole full for 10 minutes before starting test.
(3) Checked hole for 5 minutes - it took 30 1/2 gallons of water.
NOTE: 3" fishtail and air. Tested with 10' of perforated 1 1/2" pipe in hole.
0-20' (1) Ran water into hole at rate of 8-10 gpm for 55 minutes to fill hole. (2) It required 7 to 8 gpm to keep hole full.
(3) Did not run complete 5 minutes test as we ran out of water, but hole still taking 7-8 gpm.
NOTE: 3" fishtail bit and air. (Moved 5' east of 10' hole and drilled 20' hole.) Tested with 20' of perforated 1 1/2" pipe in hole to keep it open.

PR 6

El. 3699.2




0-3' SAND, very fine, silty, trace gravel (-1"), soft, tan, dry. (SM)
3'-31' SAND, very fine, some fine with little medium 25'-31', few slightly silty layers, trace gravel (-3/4") and clay-balls in scattered thin layers, firm, tan-gray, moist to wet at 25'. (SP)
31'-37' SAND, fine, some very fine, little medium and coarse, slightly gravelly to gravelly (-1 1/2") in layers, few clay-balls, firm, tan. (SP-GP)
37'-39' GRAVEL (-2"), some limy coated, sandy, trace clay, firm, tan-gray. (GP)
39'-45' SAND, very fine to fine, little medium and coarse, slightly gravelly to much gravel (-2") (45%) in layers, few clayey thin layers, firm, tan, gray. (SP-GP)
45'-47.5' GRAVEL (-2"), some limy coated, sandy, few clayey seams, firm, tan-gray. (GP)
NOTE: Air-drilled with Nx tricone rockbit 0-27.5'; wash bored with mud and Nx tricone rockbit 27.5'-47.5'. Drilled without hydraulic pressure and moderate rotation 0-44.5'; used hydraulic pressure 44.5'-47.5' - gravel was binding rods in hole. Smooth fast penetration 0-31'; moderately fast penetration and slightly rough drilling 31'-40'; slow rough drilling 40'-47.5'. Logged from visual inspection of penetration resistance samples, cuttings, and drill action. Driller reported clayey layers 42'-47' (no evidence in cuttings). Hole caved 22'-25'; 40'-45' caved and unable to wash gravel out; was binding rods. Flushed hole at 25'; hole washed out 25'-27'. Lost approximately 150 gallons of heavy mud 31'-47.5'.
* Gravel may have affected test.

NOTE
For explanation and additional note, see Dwg. 20311 (23-D-556).

ALWAYS THINK SAFETY

INTERNATIONAL BOUNDARY AND WATER COMMISSION
UNITED STATES AND MEXICO
UNITED STATES SECTION
CHAMIZAL CONVENTION PROJECTS

FRANKLIN CANAL RELOCATION

LOGS OF EXPLORATION

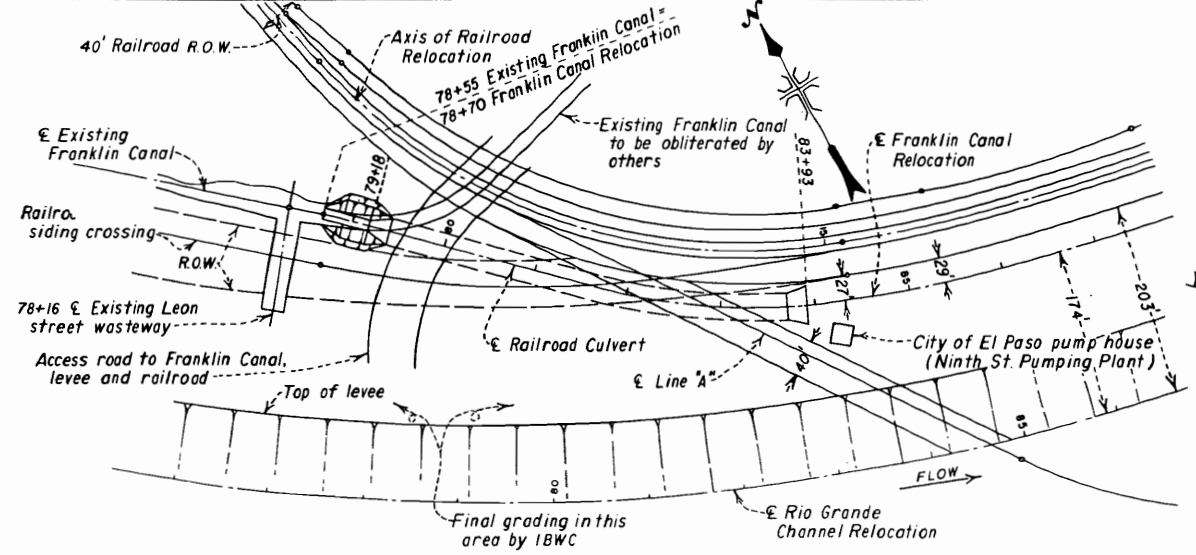
UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
DENVER, COLORADO, MAY 18, 1966
SCALE 1 INCH = 4 FEET

DRAWN R.T.S.-C.W.B. SUBMITTED
TRACED K.J.M. RECOMMENDED
CHECKED R.T.S. APPROVED CHIEF ENGINEER

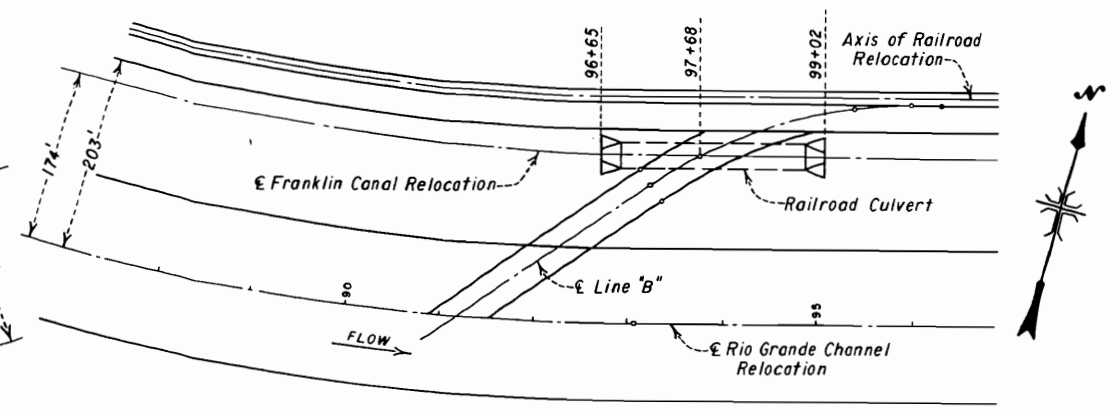
23-D-559

SUBMITTED Aug. 26, 1966 APPROVED Aug. 26, 1966
W. E. Walker PRINCIPAL ENGINEER
J. L. Friedkin COMMISSIONER

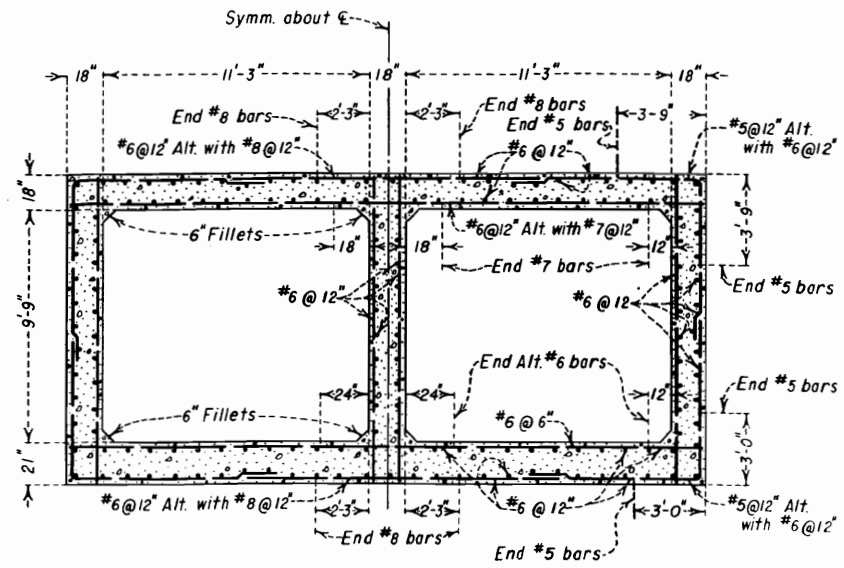
EL PASO, TEXAS 20314




PLAN FOR CULVERT AT LEON STREET

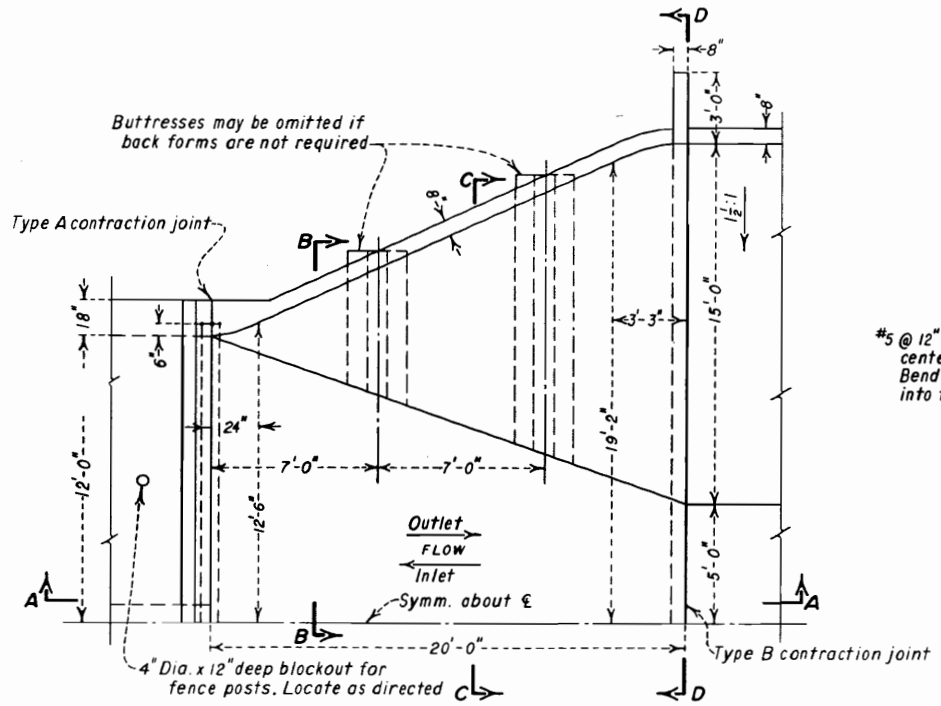



PLAN FOR LINE "B" CULVERT

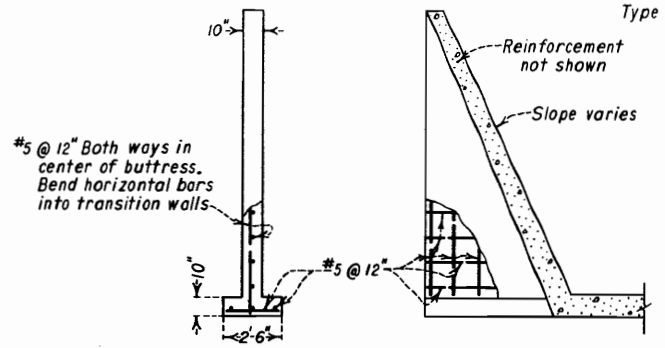



TYPICAL SECTION

SCALE OF FEET

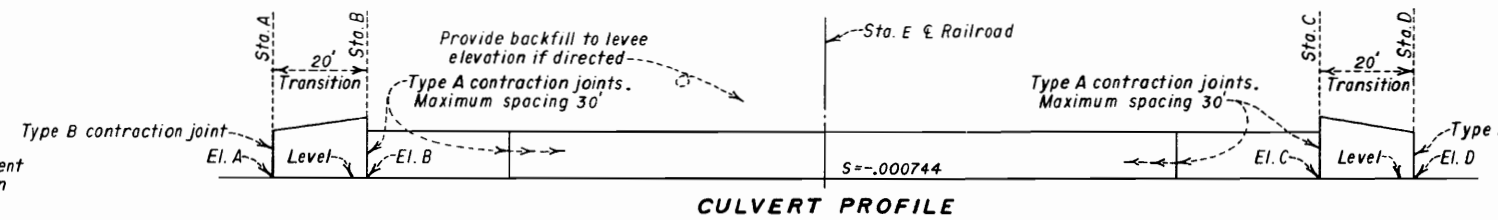



HALF PLAN OUTLET TRANSITION
(INLET SIMILAR)




TYPICAL BUTTRESS DETAIL

SCALE OF FEET




CULVERT PROFILE

## CULVERT DATA

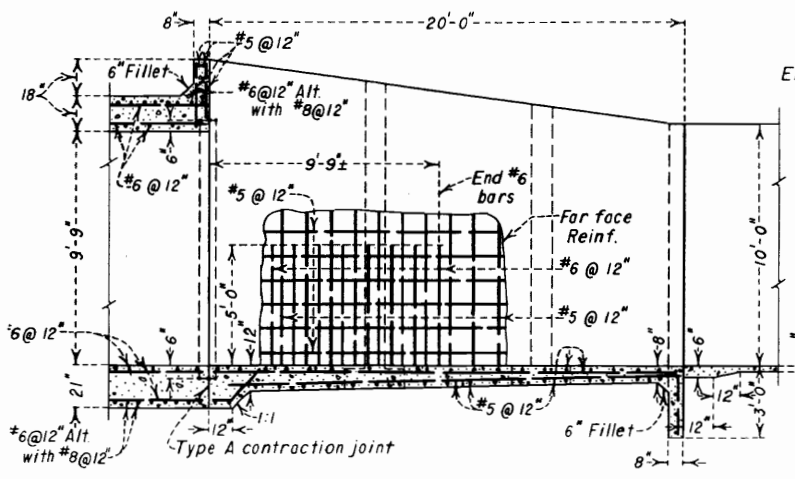
| STA. A | STA. B | STA. C | STA. D | STA. E | EL. A | EL. B | EL. C | EL. D |
|---|---|---|---|---|---|---|---|---|
| 79+18 | 79+38 | 83+73 | 83+93 | —— | 3700.37 | 3700.37 | 3700.05 | 3700.05 |
| | | | | | | | | |
| 96+65 | 96+85 | 98+82 | 99+02 | 97+68 | 3699.43 | 3699.43 | 3699.28 | 3699.28 |

## CULVERT HYDRAULIC PROPERTIES
(FOR ONE BARREL)

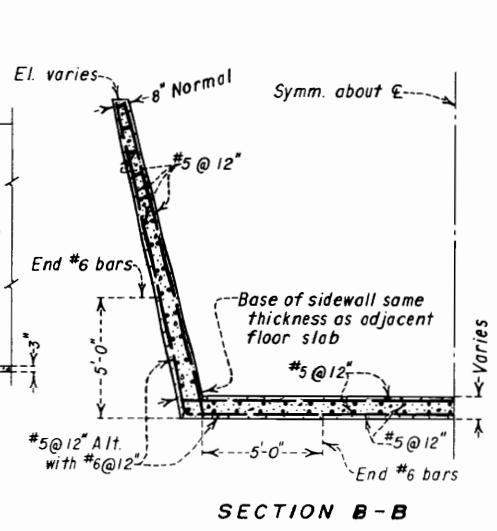
| Q | d | A | V | r | n | s |
|---|---|---|---|---|---|---|
| 600 | 8.24 | 92.70 | 6.47 | 3.34 | .014 | .000744 |

## NOTES

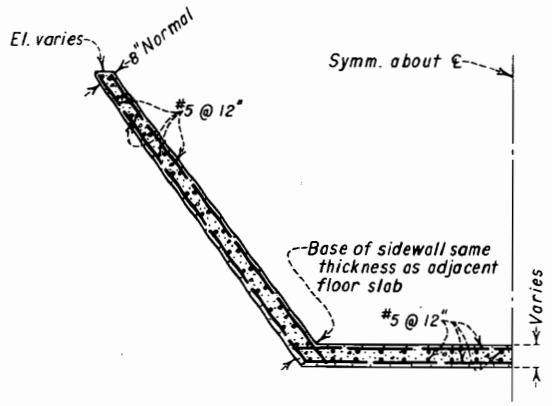
For general notes, see 20305 (23-D-531)
All elevations are on IBWC Datum.
IBWC Datum = USBR Datum plus 40.97'.
Stations are approximate and may be adjusted if required after the canal centerline is established in the field.
Stations and elevations refer to invert of culverts unless otherwise shown.
For details of contraction joints, see 20306 (23-D-532)
Provide 2-4" Dia. by 12" deep blockouts for fence posts at approximately 10' centers at each end of culverts. Locate as directed. Fence to be constructed by others.
Provide 6"x6" concrete curbs on each side of track near toe of ballast to retain ballast. Locate as directed.
The location of each culvert may be adjusted as required to conform to final railroad location. Culvert headwalls shall not be closer than 10' in any direction from the nearest railroad right-of-way. The inlet headwall of the culvert at Sta. 79+03 shall not be closer than 4' to the nearest edge of the access road right-of-way.
Top of railroad culverts allows for a minimim depth of ballast of 9" and a 7" thick tie, or a total of 16" below base of rail.
Culvert boxes designed for Cooper's E-72 railroad loading with impact as specified by current AREA specifications and for an AASHO highway loading of H-20, S-16.
Construct Line "B" culvert on straight line between stations A and B
Curved portion of culvert at Leon Street may be constructed on chords of 30'-0" maximum length between contraction joints.
Minimum compressive strength of concrete in culvert boxes shall be 3500 p.s.i. at 28 days.



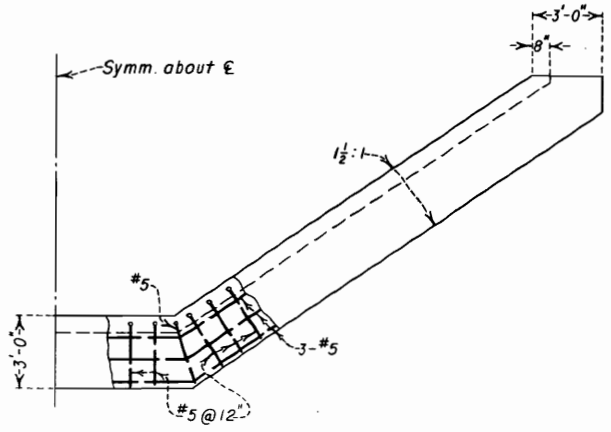

SECTION A-A




SECTION B-B




SECTION C-C




ELEVATION D-D

| | |
|---|---|
| 8-29-66 D-T.R. | ADDED NOTE ON CONCRETE STRENGTH. |

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
DENVER, COLO. MAY 17, 1966
DRAWN C.V.A. SUBMITTED 23 Briggs
TRACED G.L.S. RECOMMENDED
CHECKED APPROVED
23-D-530

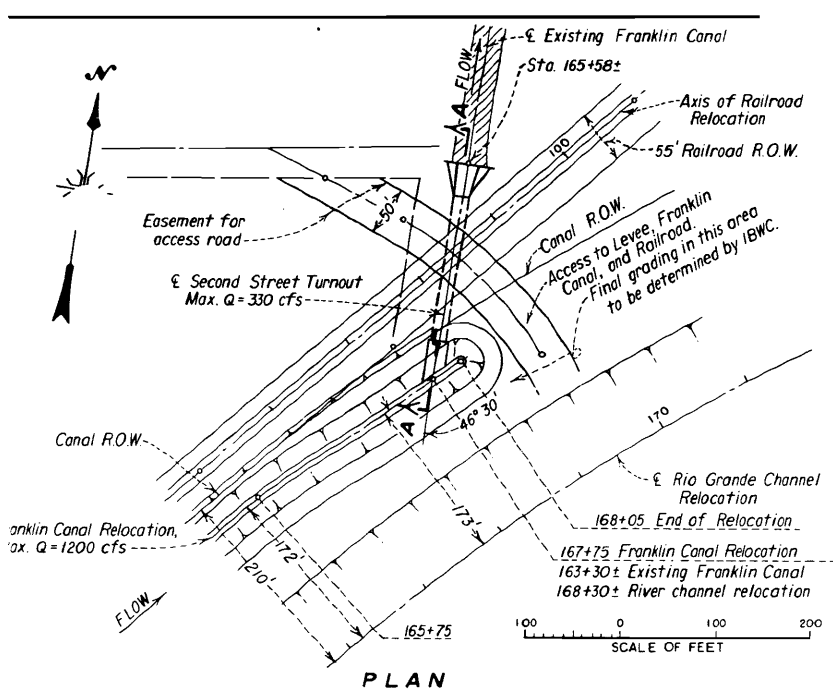
INTERNATIONAL BOUNDARY AND WATER COMMISSION
UNITED STATES AND MEXICO
UNITED STATES SECTION
CHAMIZAL CONVENTION PROJECTS

FRANKLIN CANAL RELOCATION

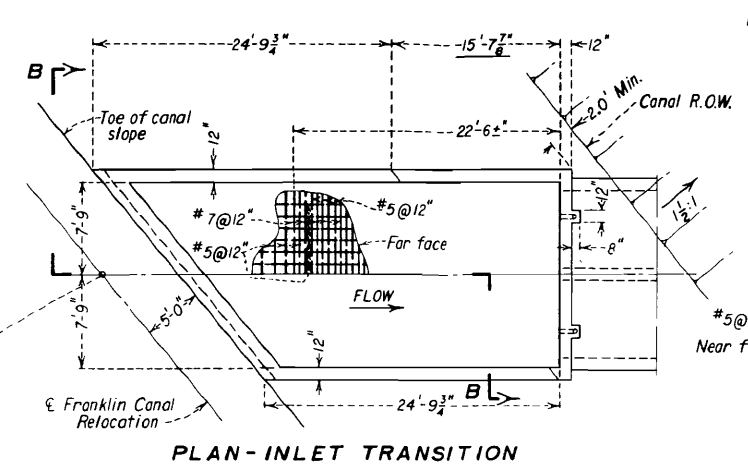
RAILROAD CULVERTS

SUBMITTED Aug. 26 1966 APPROVED Aug. 26 1966
W. E. Ulrich — PRINCIPAL ENGINEER
COMMISSIONER

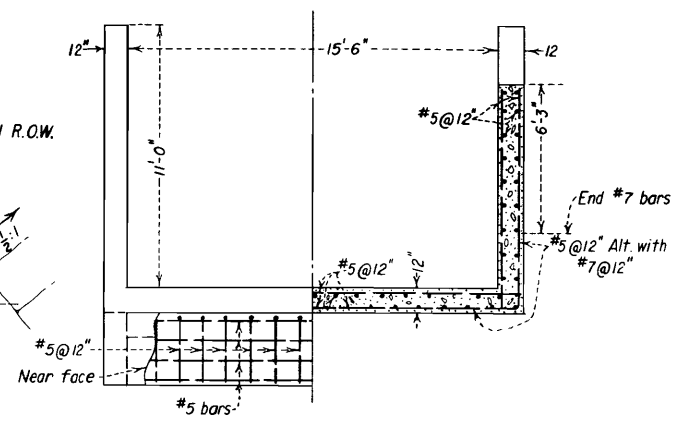
EL PASO, TEXAS 20304



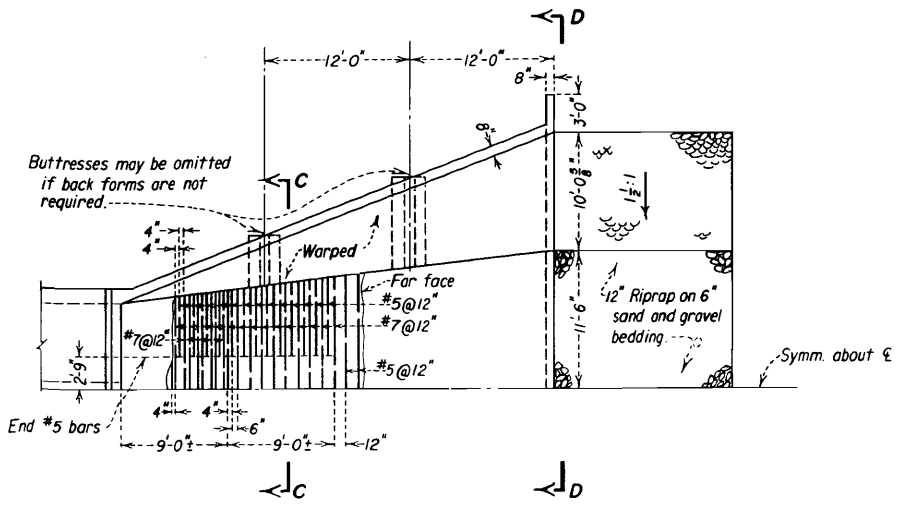

PLAN



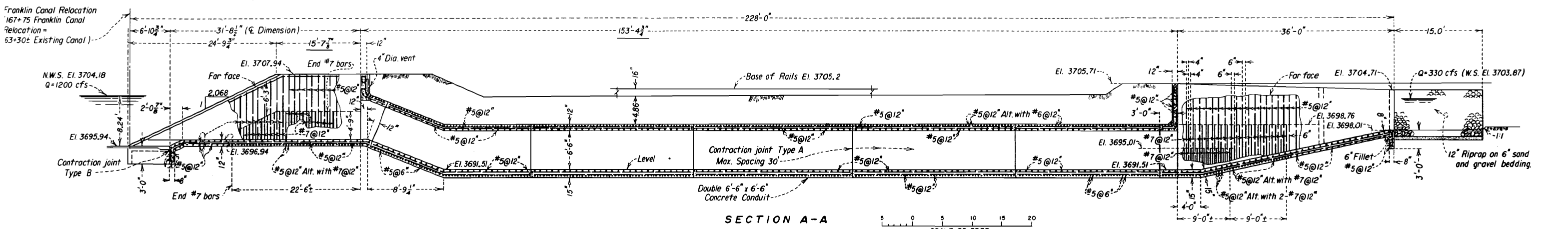

PLAN - INLET TRANSITION

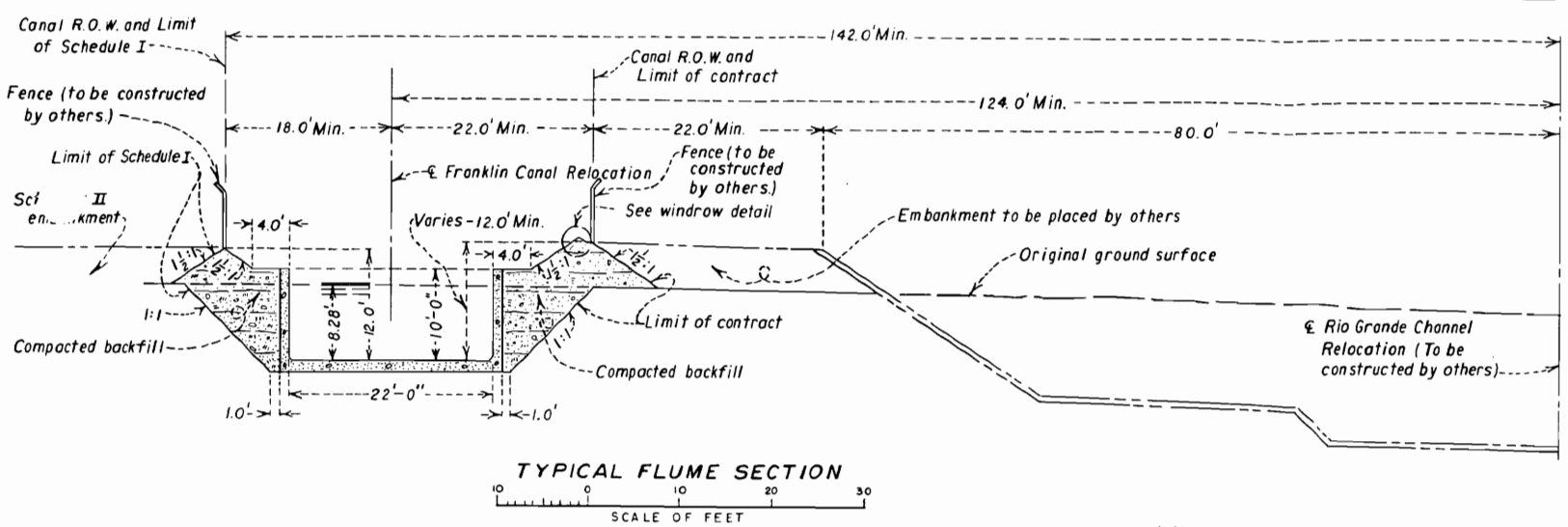



SECTION B-B



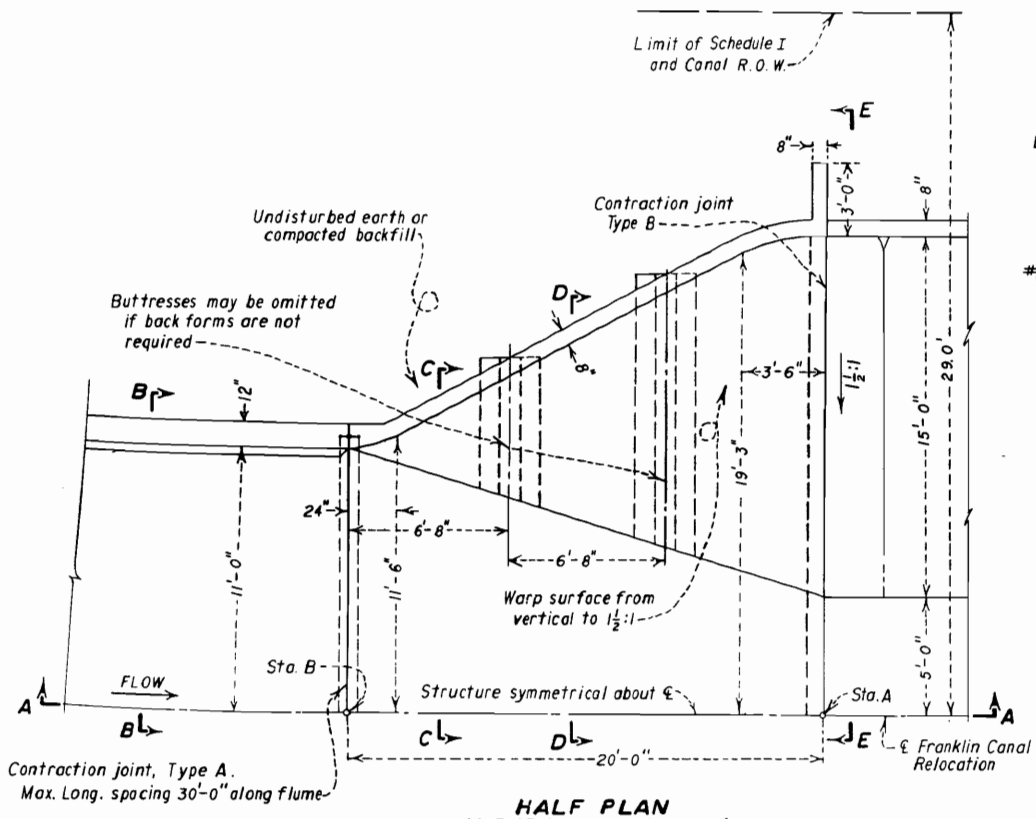

HALF PLAN - OUTLET TRANSITION


Franklin Canal Relocation
167+75 Franklin Canal
Relocation =
63+30± Existing Canal )
228'-0"
6'-10 3/4"
31'-8 1/2" (℄ Dimension)
153'-4 3/4"
36'-0"
15.0'
24'-9 3/4"
15'-7 7/8"
12"
4" Dia. vent
N.W.S. El. 3704.18
Q = 1200 cfs
El. 3707.94
End #7 bars
Far face
Base of Rails El. 3705.2
El. 3705.71
12"
4"
4"
6"
Far face
El. 3704.71
Q = 330 cfs (W.S. El. 3703.87)
2,068
#5@12"
6'-3"
16"
4.86'
12"
#5@12"
#5@12" Alt. with #6@12"
#5@12"
3'-0"
2'-0 7/8"
8.24'
El. 3695.94
#7@12"
4'-9"
12"
#5@12"
#5@12"
El. 3698.76
El. 3698.01
8"
El. 3696.94
#5@12"
#5@12"
#5@12"



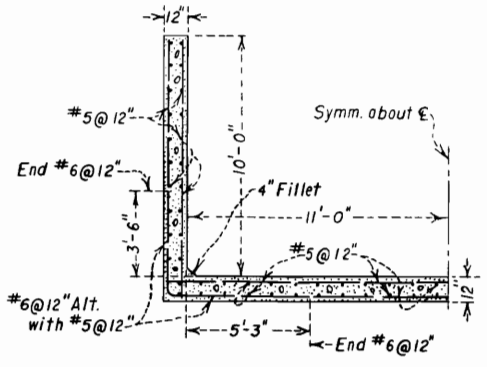

TYPICAL FLUME SECTION

SCALE OF FEET 10 0 10 20 30

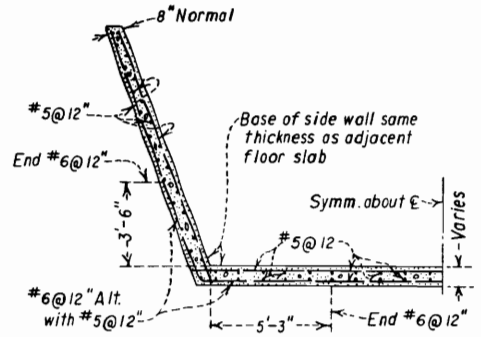



HALF PLAN
(OUTLET SHOWN-INLET SIMILAR)

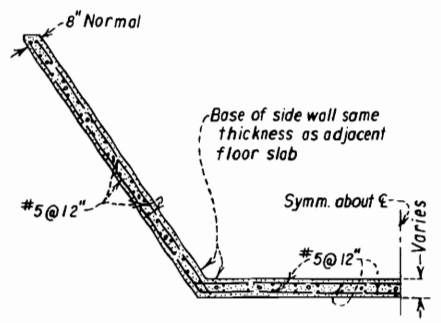
SCALE OF FEET 1 0 5 10 15



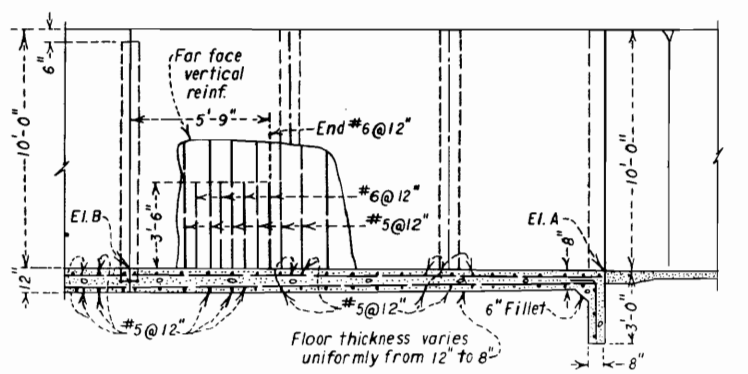

SECTION B-B



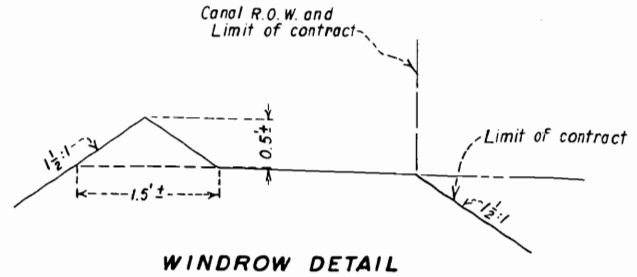

SECTION C-C



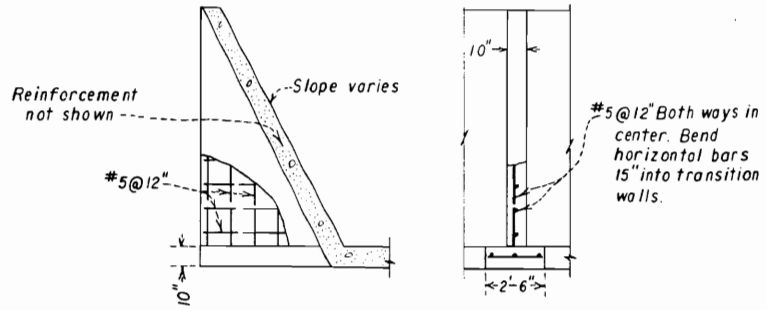

SECTION D-D



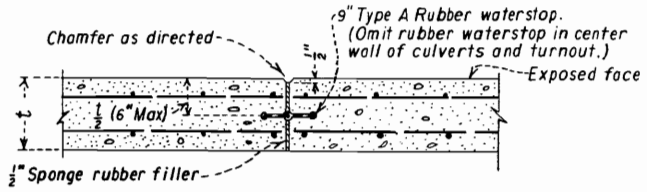

SECTION A-A



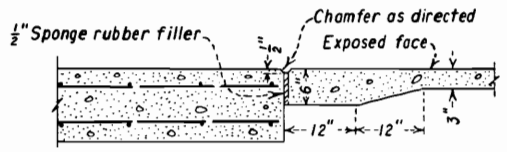

WINDROW DETAIL



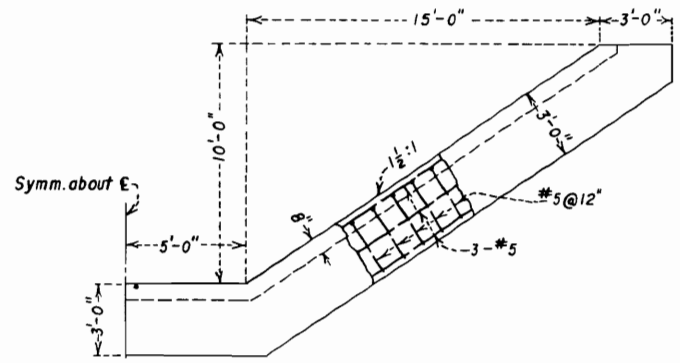

TYPICAL BUTTRESS DETAIL




CONTRACTION JOINT TYPE A




CONTRACTION JOINT TYPE B




ELEVATION E-E

## FLUME HYDRAULIC PROPERTIES

| Q | d | A | V | r | n | s |
|---|---|---|---|---|---|---|
| 1200 | 8.28 | 182.16 | 6.59 | 4.72 | .014 | .000486 |

| STA. | INLET | | OUTLET | |
|---|---|---|---|---|
| | STA. | ELEV. | STA. | ELEV. |
| A | 129+55 | 3697.80 | 135+40 | 3697.51 |
| B | 129+75 | 3697.79 | 135+20 | 3697.52 |

## NOTES

For general notes, see 20305 (23-D-531).
All elevations are on IBWC Datum.
IBWC Datum = U.S.B.R. Datum plus 40.97'
For details of canal section, see 20303 (23-D-529).
For location of flume, see 20301 (23-D-527).
Stations are approximate and may be adjusted if required after the canal centerline is established in the field.
Rectangular flume and transitions may be constructed on chords of 30'-0" maximum length between contraction joints.
The elevation and slope of the top of the right canal bank (levee) shall be as directed.

ALWAYS THINK SAFETY

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

DRAWN M.L.V. SUBMITTED
TRACED H.W.G. REC'D.
CHECKED APPROVED
ACTING CHIEF ENGINEER

23-D-532 DENVER, COLO. MAY 18, 1966

INTERNATIONAL BOUNDARY AND WATER COMMISSION
UNITED STATES AND MEXICO
UNITED STATES SECTION
CHAMIZAL CONVENTION PROJECTS

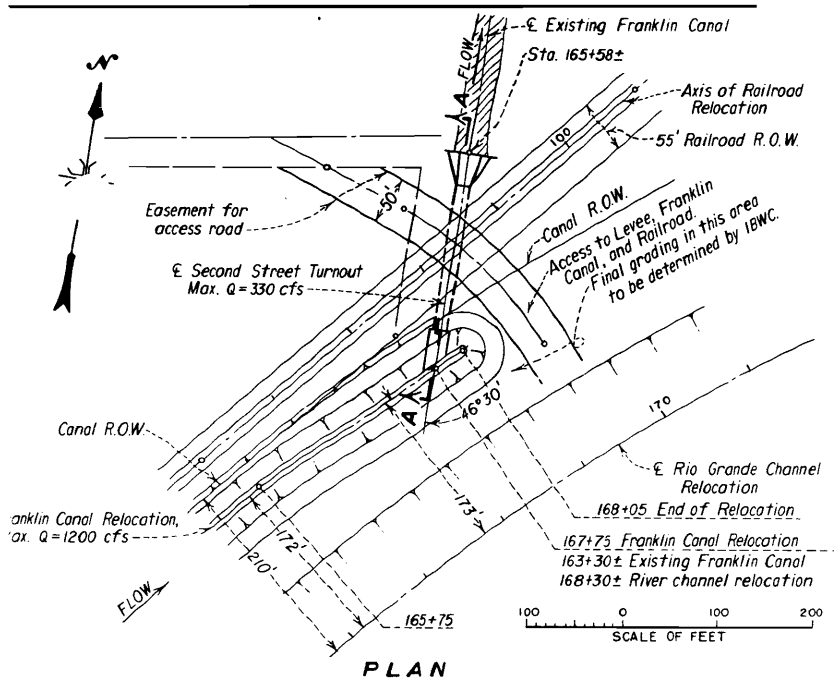
FRANKLIN CANAL RELOCATION

RECTANGULAR FLUME

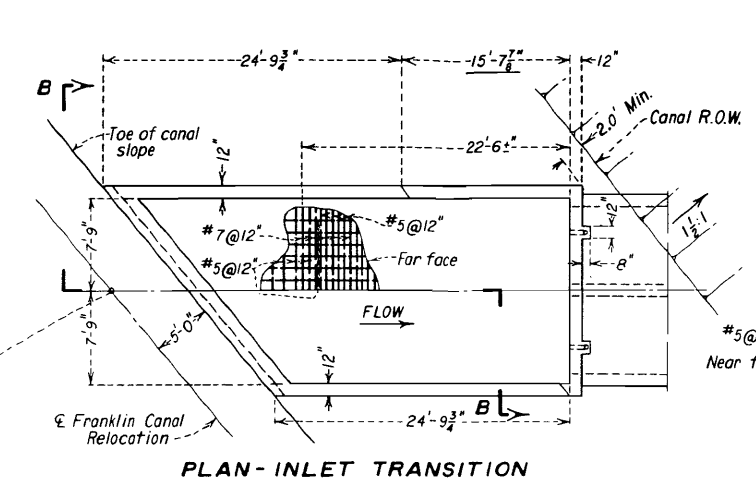
SUBMITTED: Aug. 26 1966 APPROVED: Aug. 26 1966

PRINCIPAL ENGINEER COMMISSIONER

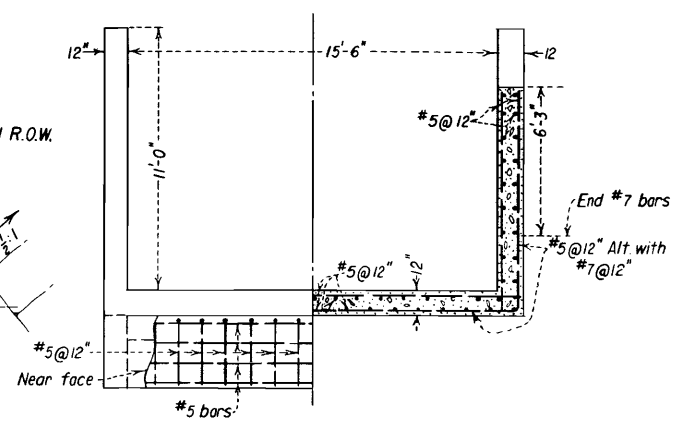
EL PASO, TEXAS 20306



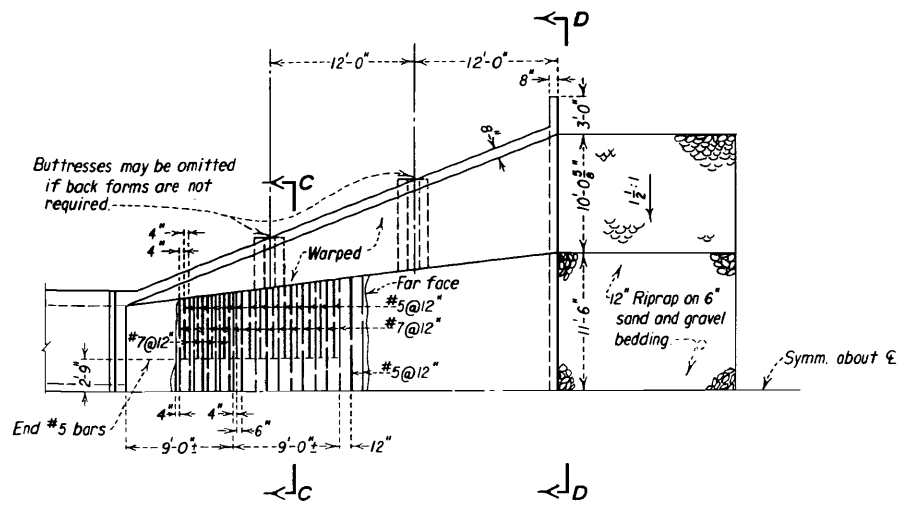

PLAN



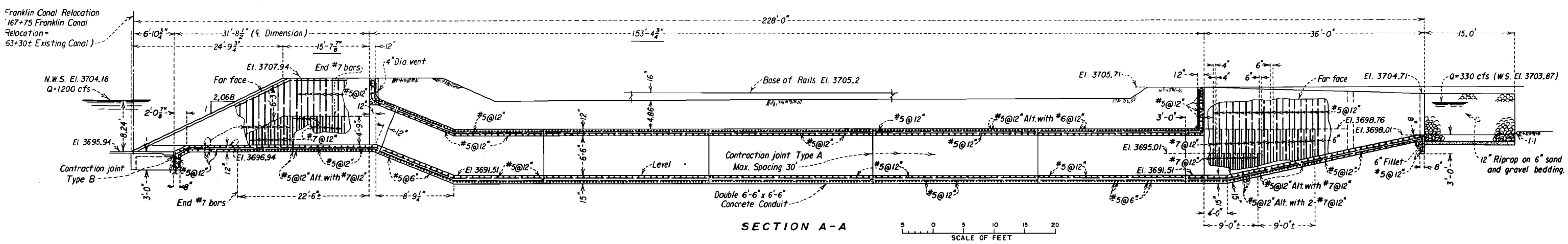

PLAN - INLET TRANSITION




SECTION B-B




HALF PLAN - OUTLET TRANSITION

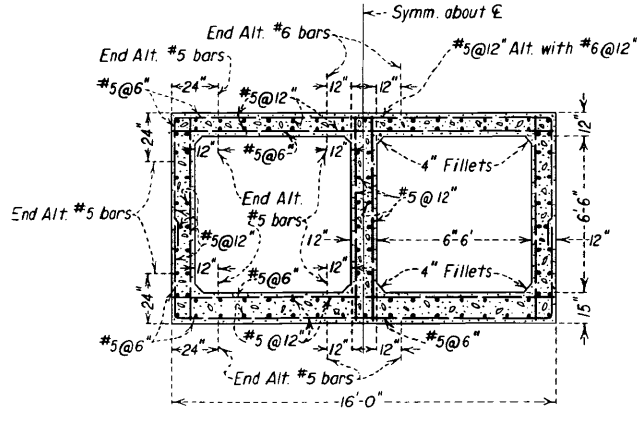



SECTION A-A

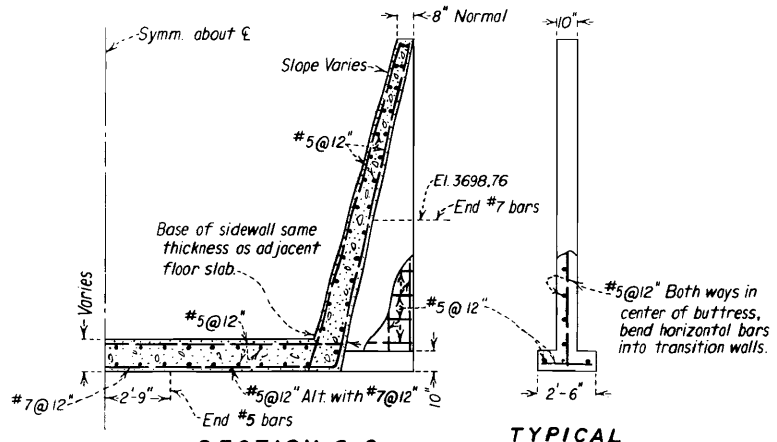
SCALE OF FEET

## TURNOUT HYDRAULIC PROPERTIES
(FOR ONE BARREL)

| Q | A | V | r | n | S |
|---|---|---|---|---|---|
| 16.5 | 42.25 | 3.905 | 1.625 | .014 | .0007086 |

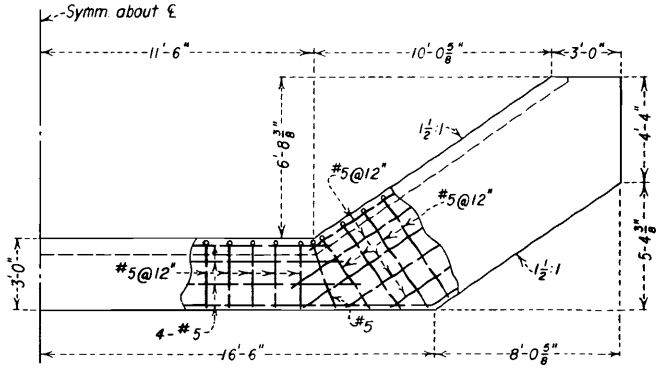



TYPICAL BOX SECTION




SECTION C-C

TYPICAL BUTTRESS DETAIL




ELEVATION D-D

1 0 5 10 15
SCALE OF FEET

## NOTES

For general notes see 20305 (23-D-531)
All elevations are on IBWC Datum = USBR Datum plus 40.97'.
Stations are approximate and may be adjusted if required after the canal centerline is established in the field.
For details of contraction joints see 20306 (23-D-532)
Turnout boxes designed for cooper's E-72 railroad loading with impact as specified by current AREA specifications.
Underlined dimension, not to scale.
Minimum compressive strength of concrete in culvert boxes shall be 3500 p.s.i. at 28 days.

| | |
|---|---|
| 8-29-66 D-7-79. | CHANGED INLET DIMENSION. CHANGED ALINEMENT OF CANAL RELOCATION FROM STA. 140+50 TO END. ADDED NOTE ON CONC. STRENGTH. |

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

DRAWN J.W.L. SUBMITTED J.E.S.
TRACED W.D.A. RECOMMENDED
CHECKED APPROVED ACTING CHIEF ENGINEER
DENVER, COLO. MAY 17, 1966

INTERNATIONAL BOUNDARY AND WATER COMMISSION
UNITED STATES AND MEXICO
UNITED STATES SECTION
CHAMIZAL CONVENTION PROJECTS

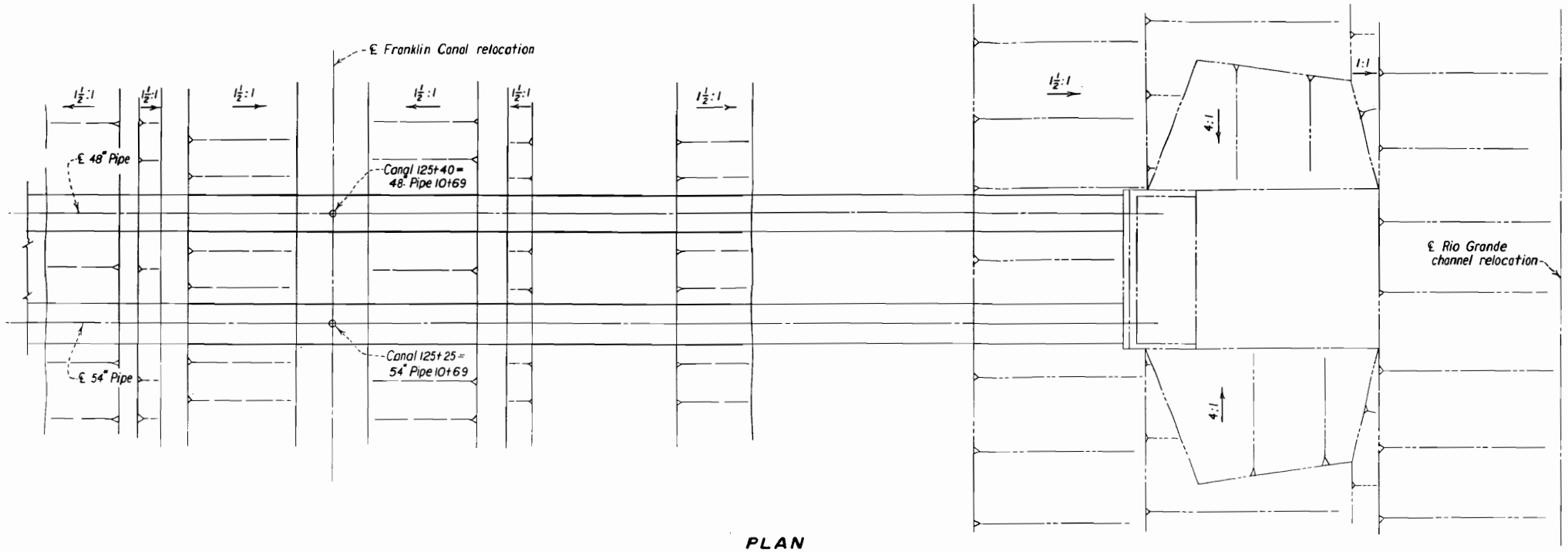
FRANKLIN CANAL RELOCATION

SECOND STREET TURNOUT

23-D-533

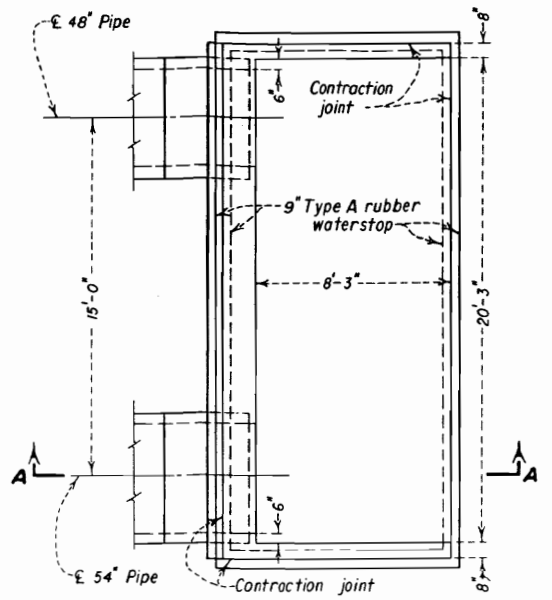
SUBMITTED Aug. 26 1966 — PRINCIPAL ENGINEER
APPROVED Aug. 26 1966 — COMMISSIONER

EL PASO, TEXAS 20307




PLAN

SCALE OF FEET



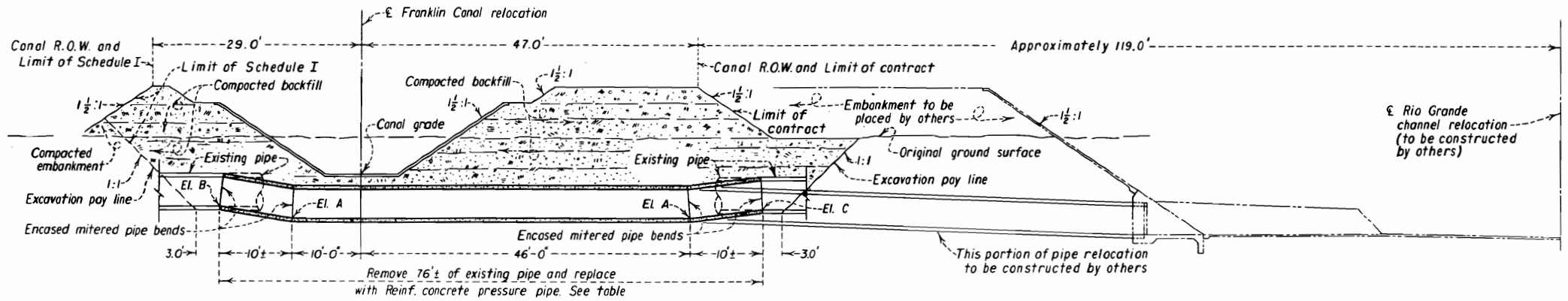

PLAN OF OUTLET

(NOT PART OF THIS CONTRACT)

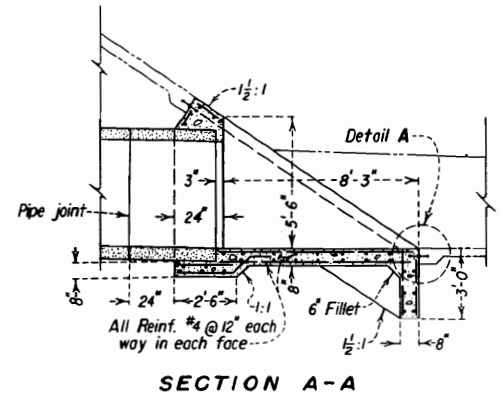
SCALE OF FEET

## GENERAL NOTES

Chamfer all exposed edges of concrete $\frac{3}{4}$ inch unless otherwise shown.
All structures shall be placed on undisturbed earth or thoroughly compacted fill.
Concrete thickness shall vary uniformly between dimensions shown.
Dimensions are to centerline of joints unless otherwise shown.
Joint filler shall be securely fastened to one face of concrete.
For details of rubber waterstop see 40-D-2867.
For reinforcement detailing requirements see 40-D-7004.




PROFILE

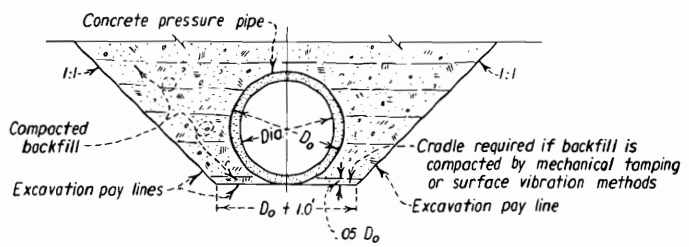



SECTION A-A

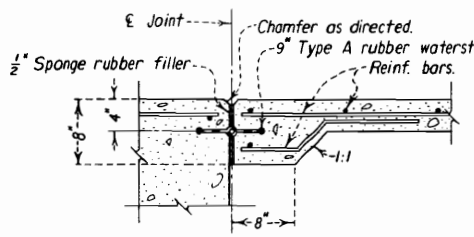
## NOTES

Elevation, grades and lengths of sewer pipe are approximate and shall be adjusted to meet actual field conditions
The top of sewer pipe shall not be less than one foot below the underside of canal lining
For embedment of precast pressure pipe in monolithic concrete see 222-D-21536
For bends in precast pressure pipe see 222-D-21534
Elevations on existing 48" pipe of 3693.43 at 10+77, and and 3691.30 at 18+90 were furnished by IBWC
Elevations on existing 54" pipe of 3693.79 at 10+03 and 3692.46 at 18+90 were furnished by IBWC
All elevations are on IBWC Datum
IBWC Datum = USBR Datum plus 40.97'
IBWC Datum = El. Paso Datum plus 7.17'
Stations are approximate
For details of canal sections see 20303 (23-D-529)

| ELEVATIONS AND TYPE OF PIPE | | |
|---|---|---|
| Canal station | 125+25 | 125+40 |
| Pipe | 54 D 25 | 48 D 25 |
| Canal grade | 3698.01 | 3698.00 |
| El. A | 3691.80 | 3692.30 |
| El. B | 3693.72± | 3693.48± |
| El. C | 3693.61± | 3693.29± |




DETAIL OF CRADLE




DETAIL A

JOINT BETWEEN STRUCTURE AND RIVER LINING

ALWAYS THINK SAFETY

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

DRAWN ... G.A.P. ... SUBMITTED. W.E. Ulrich
TRACED ... A.P.R. ... RECM'D. Wm. A. King
CHECKED. W.E.U. APPROVED. J.L. Lauchner
APPROVED CHIEF ENGINEER

DENVER, COLO. MAY 18, 1966

INTERNATIONAL BOUNDARY AND WATER COMMISSION
UNITED STATES AND MEXICO
UNITED STATES SECTION
CHAMIZAL CONVENTION PROJECTS

FRANKLIN CANAL RELOCATION

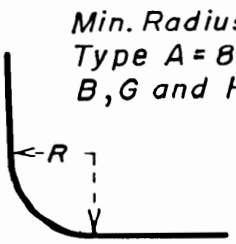
STORM SEWER MODIFICATIONS

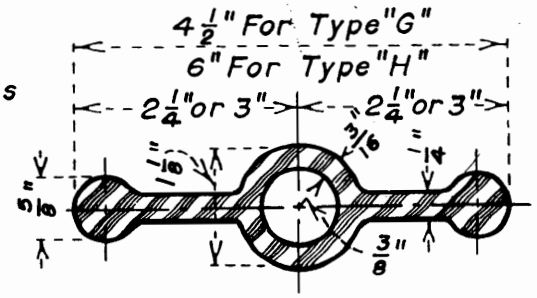
23-D-531

SUBMITTED Aug. 26, 1966 APPROVED Aug. 26, 1966
W.E. Ulrich — PRINCIPAL ENGINEER
J.L. Lauchner — COMMISSIONER

EL PASO, TEXAS

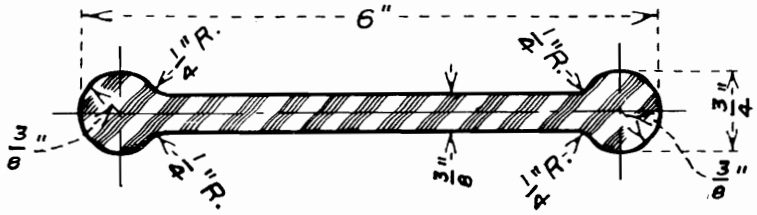
20305



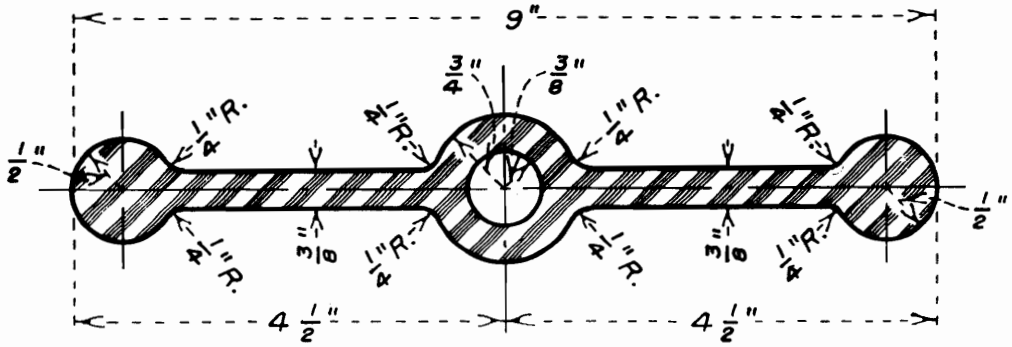




FOR FIELD INSTALLATION

TYPES "G" AND "H"




TYPE "B"




TYPE "A"

## TOLERANCES

± 1/4" Width, Type A.

± 1/8" Width, Type B, G, and H.

+ 1/16" − 1/32" Web thickness, end bulb diameter, and wall thickness on center bulb, all types.

± 1/8" Diameter of center bulb, both I.D. and O.D., Types A, G, and H.

ALWAYS THINK SAFETY

| | |
|---|---|
| 12-18-59 D | REVISED AND RETRACED. |

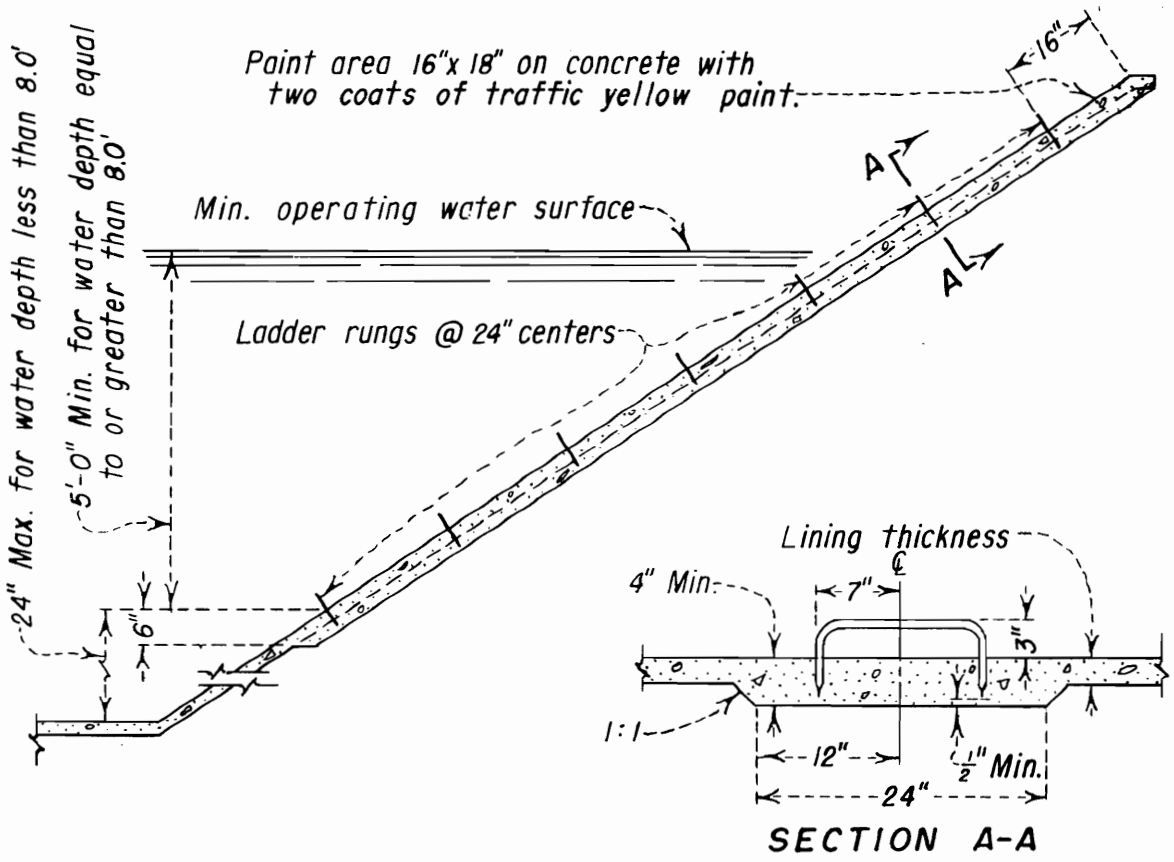
UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

STANDARD DESIGNS

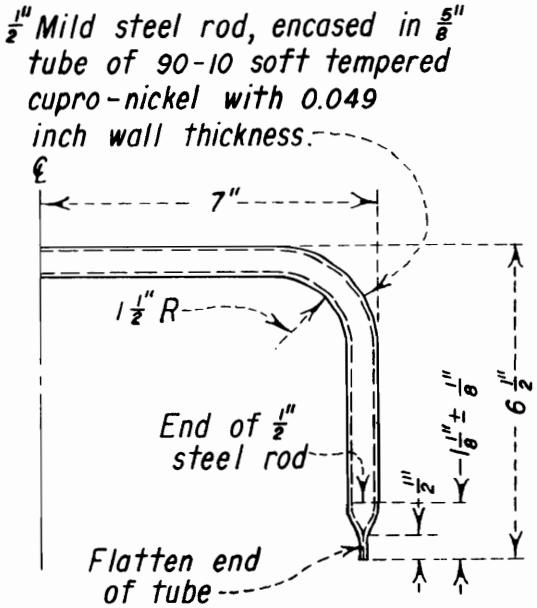
# RUBBER WATERSTOPS

## TYPES "A", "B", "G," AND "H"

| | |
|---|---|
| DRAWN H.C.C. | SUBMITTED H.R.McBirney |
| TRACED E.V.C. | RECOMMENDED K.B.Keener |
| CHECKED P.W.T. | APPROVED Walker R. Young |
| DENVER, COLO. 5-7-41 | 40-D-2867 |




SECTION A-A




LADDER RUNG

## NOTES

Ladder rungs to be placed during concrete lining operations, located at 750 ft. intervals on both sides of canal, and upstream of structures as directed.

Ladder rungs are not required on sides of canals where the vertical lining height is less than 2½ feet.

ALWAYS THINK **SAFETY**

THIS DWG. SUPERSEDES 40-D-4848

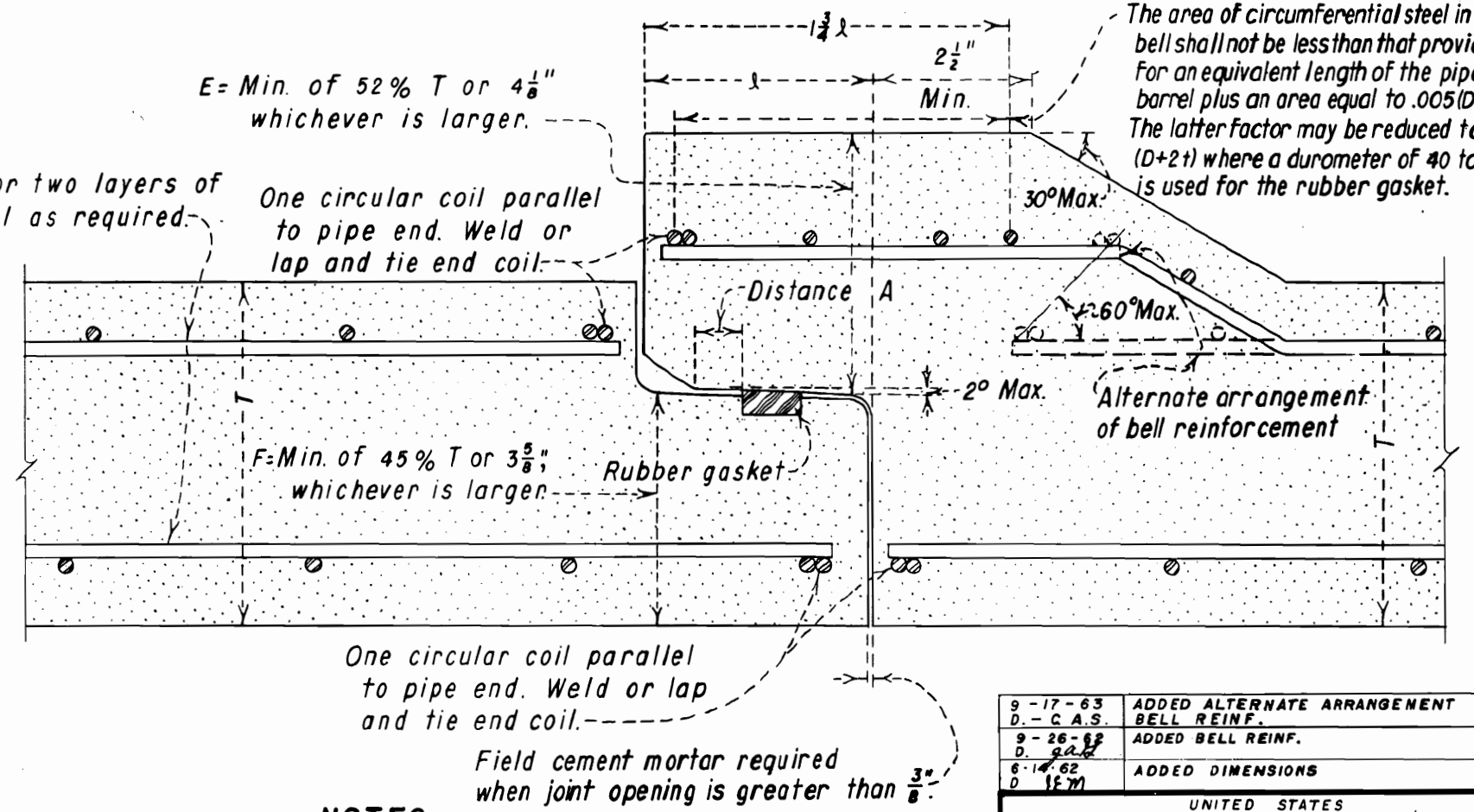
UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
STANDARD DESIGNS

# TYPICAL SAFETY LADDER FOR CONCRETE LINED CANALS

| | | | |
|---|---|---|---|
| DRAWN | T.R.H. | SUBMITTED | P. W. Tennelle |
| TRACED | S.W.M. | RECOMMENDED | M. A. Light |
| CHECKED | H.W.B. | APPROVED | [signature] CHIEF ENGINEER |

DENVER, COLORADO NOV. 12, 1963

40-D-5927




**NOTES**

t = Minimum acceptable pipe wall thickness for class and size of pipe specified.
T = Wall thickness of pipe furnished.
Where the thickness of the bell is less than t or spigot is less than 80% T a durometer of 40 to 45 shall be used for the rubber gasket.

ALWAYS THINK SAFETY

THIS DWG. SUPERSEDES 40-D-5239 & 5757

| | |
|---|---|
| 9-17-63 D.-C.A.S. | ADDED ALTERNATE ARRANGEMENT BELL REINF. |
| 9-26-62 D. gak | ADDED BELL REINF. |
| 6-14-62 D. EFM | ADDED DIMENSIONS |

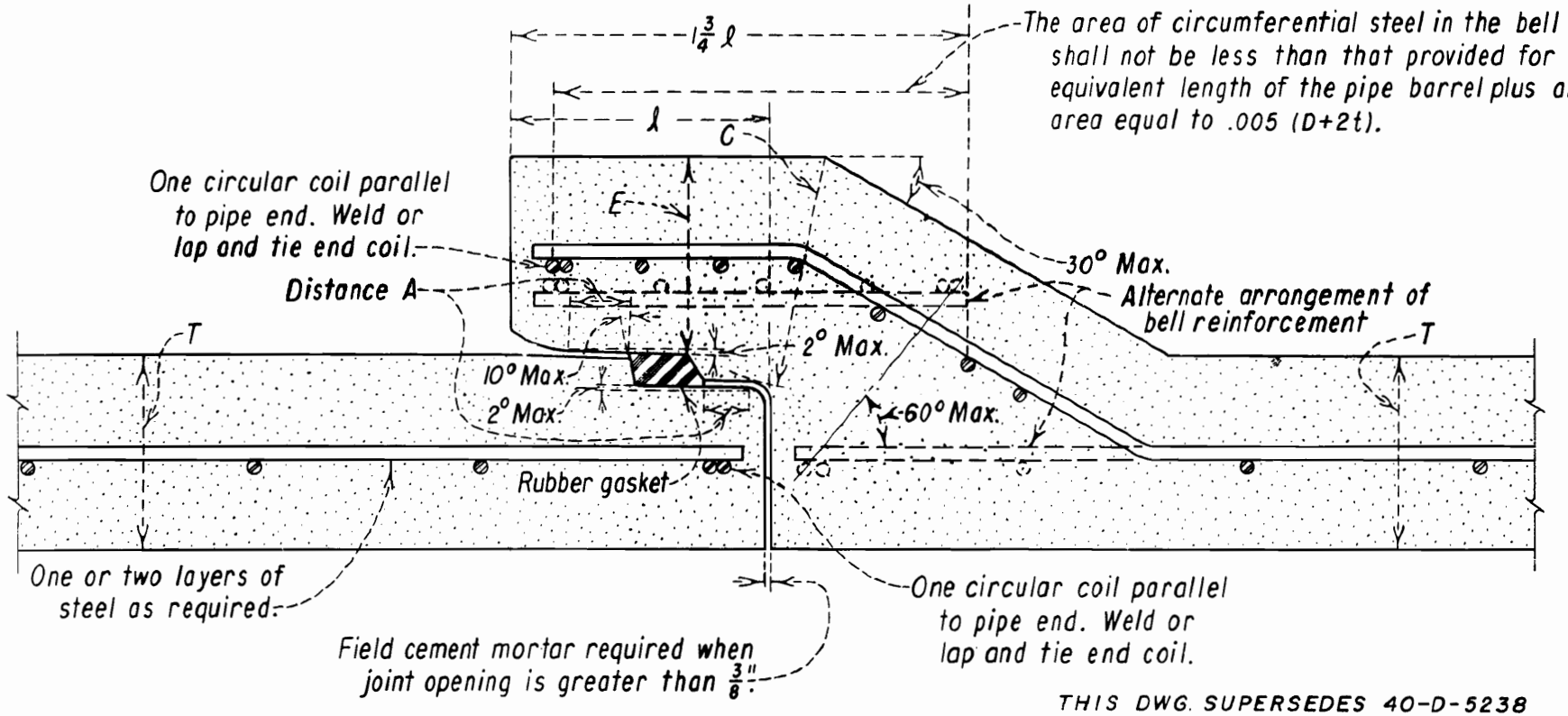
UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
STANDARD DESIGN

# PRECAST CONCRETE PIPE JOINT
## TYPE R-4 — BELL AND SPIGOT
## (PIPE WALL THICKNESS 4⅝" & LARGER)

DRAWN E.V.G. SUBMITTED
TRACED L.A.C. RECOMMENDED
CHECKED APPROVED
ASST. COMM & CHIEF ENGR.

DENVER, COLO. APRIL 19, 1962

40-D-5809




THIS DWG. SUPERSEDES 40-D-5238

## NOTES

D = Internal diameter of pipe.
t = Minimum acceptable pipe wall thickness for class and size of pipe specified.
T = Wall thickness of pipe furnished
$E \geq t$
$C \geq 1.2\,t$

| | |
|---|---|
| 9-17-63 D. C.A.S. | ADDED ALTERNATE ARRANGEMENT OF BELL REINFORCEMENT. |
| 9-26-62 D. JAH | REMOVED DIM. F |
| 6-14-62 D. JEM | ADDED DIMENSIONS |

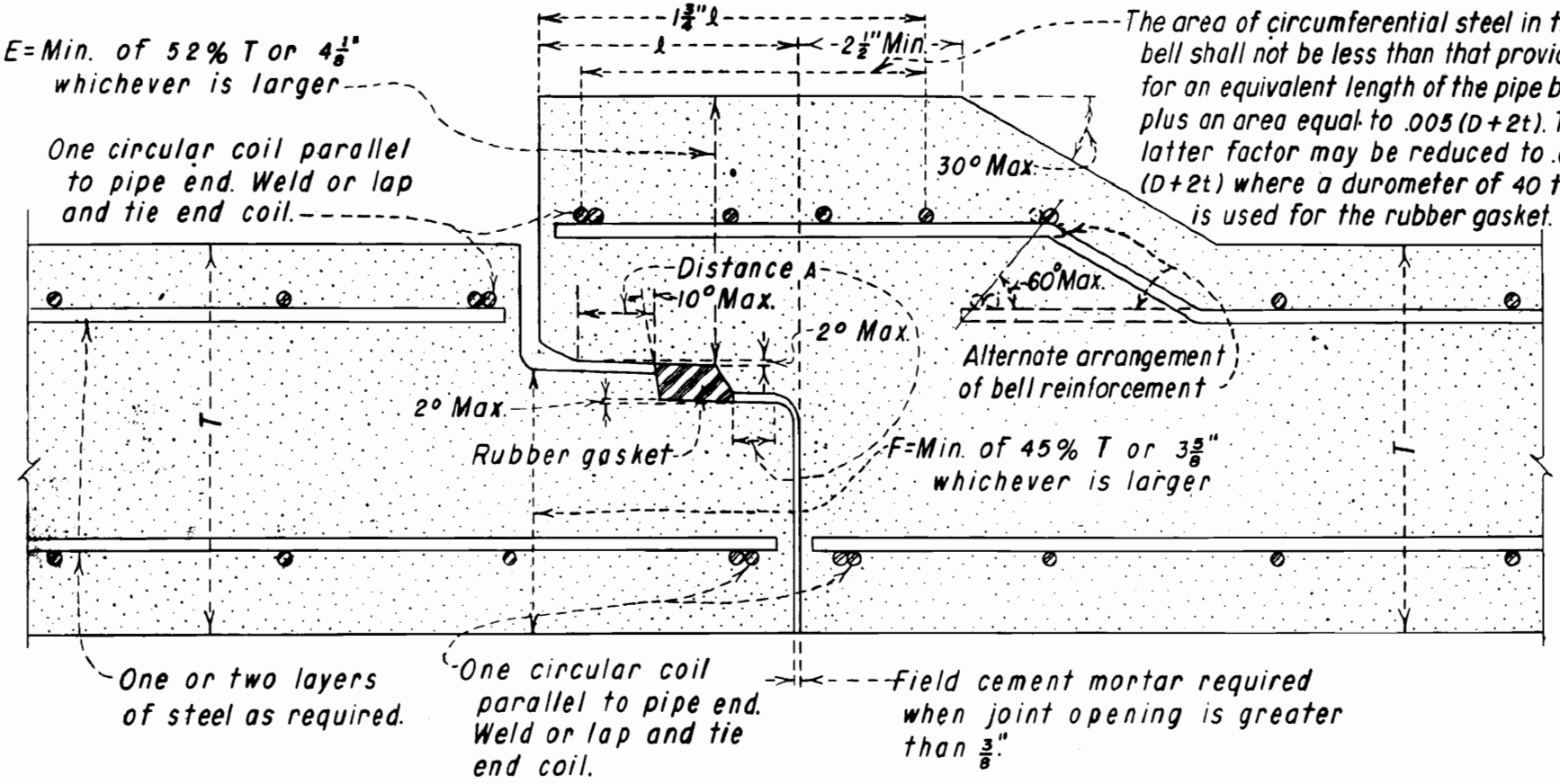
UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
STANDARD DESIGN

# PRECAST CONCRETE PIPE JOINT
## TYPE R-3—BELL AND SPIGOT
## (PIPE WALL THICKNESS 2" TO 4½" INCL.)

DRAWN E.V.G. SUBMITTED
TRACED T.R.H. RECOMMENDED
CHECKED ENG JEM APPROVED
ASST. COMM. & CHIEF ENGR.

DENVER, COLO. APRIL 19, 1962

40-D-5806




THIS DWG. SUPERSEDES 40-D-5238

## NOTES

t = Minimum acceptable pipe wall thickness for class and size of pipe specified.
T= Wall thickness of pipe furnished.
Where the thickness of the bell is less than t or spigot is less than 80% T a durometer of 40 to 45 shall be used for the rubber gasket.

| | |
|---|---|
| 9-17-63 D.-C.A.S. | ADDED ALTERNATE ARRANGEMENT OF BELL REINF. |
| 9-26-62 D. J.A.K. | ADDED BELL REINF., MOVED F DIM. |
| 6-14-62 D J.E.M. | ADDED DIMENSIONS |

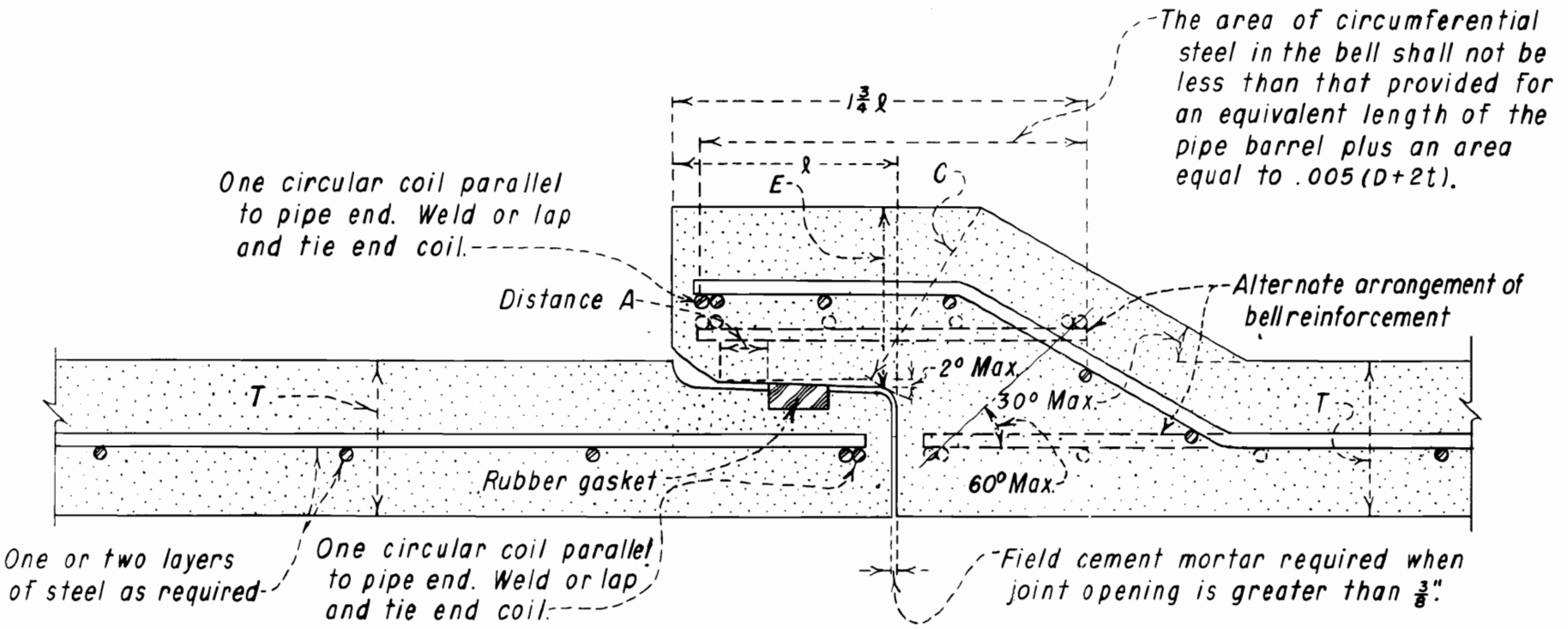
UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
STANDARD DESIGN

# PRECAST CONCRETE PIPE JOINT
## TYPE R-3 — BELL AND SPIGOT
## (PIPE WALL THICKNESS 4 5/8" & LARGER)

DRAWN E.V.G. SUBMITTED
TRACED L.A.C. RECOMMENDED
CHECKED APPROVED ASST. COMM. & CHIEF ENGR.

DENVER, COLO. APRIL 19, 1962

40-D-5807




THIS DWG. SUPERSEDES 40-D-5239 & 5757

## NOTES

D = Internal diameter of pipe.
t = Minimum acceptable pipe wall thickness for class and size of pipe specified.
T = Wall thickness of pipe furnished.
E ≥ t
C ≥ 1.2 t

ALWAYS THINK SAFETY

| | |
|---|---|
| 9-17-63 D.- C.A.S. | ADDED ALTERNATE ARRANGEMENT OF BELL REINFORCEMENT. |
| 4-2-63 D-JCM | REMOVED NOTE F = 80% T (MIN) |
| 9-26-62 D. J.A.B. | CHANGED ARROW FOR DIM. ℓ |
| 6-14-62 D. JCM | ADDED DIMENSIONS |

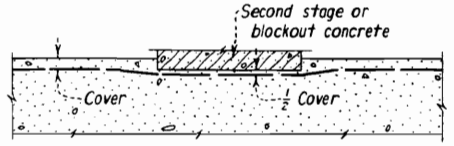
UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
STANDARD DESIGN

# PRECAST CONCRETE PIPE JOINT TYPE R-4—BELL AND SPIGOT (PIPE WALL THICKNESS 2" TO 4½" INCL.)

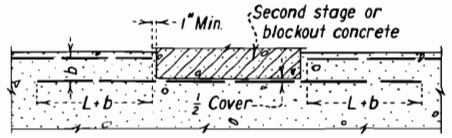
DRAWN E.V.G. SUBMITTED J.C. Kipp
TRACED L.A.C. RECOMMENDED
CHECKED EKS JCM APPROVED
ASST. COMM. & CHIEF ENGR.

DENVER, COLO. APRIL 19, 1962

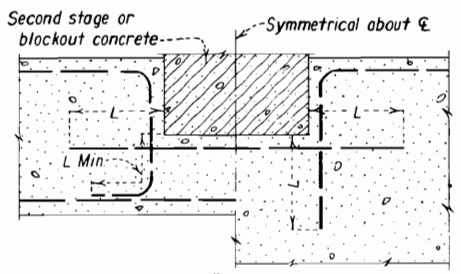
40-D-5808




REGESS LESS THAN 3" DEEP



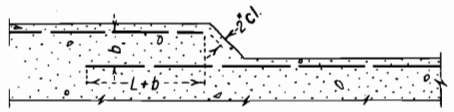

REGESS 3" TO LESS THAN 8" DEEP



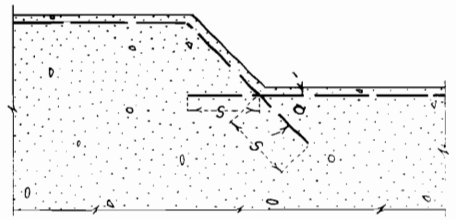

REGESS 8" OR DEEPER

TYPICAL BLOCKOUT RECESS DETAILS

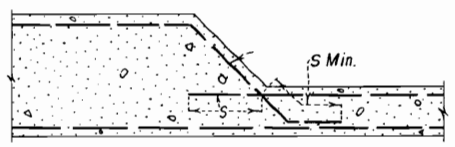
ANGLE OFFSET 2" OR LESS




ANGLE OFFSET GREATER THAN 2" TO LESS THAN 8"

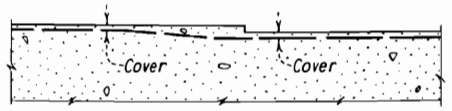


ANGLE OFFSET 8" OR MORE

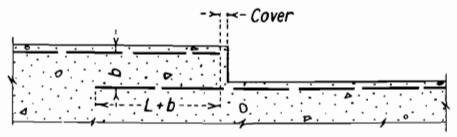



ANGLE OFFSET 8" OR MORE RESTRICTED MEMBER THICKNESS

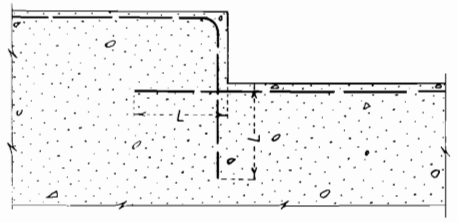
TYPICAL ANGLE OFFSET DETAILS



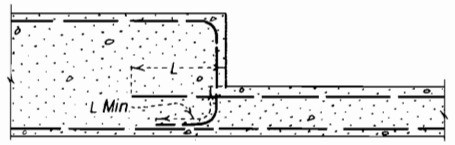

OFFSET 2" OR LESS




OFFSET GREATER THAN 2" TO LESS THAN 8"

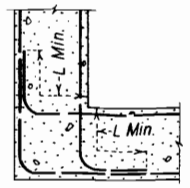



OFFSET 8" OR MORE

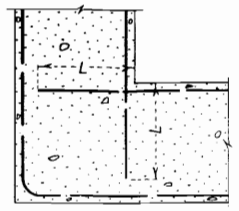



OFFSET 8" OR MORE RESTRICTED MEMBER THICKNESS

TYPICAL RIGHT ANGLE OFFSET DETAILS

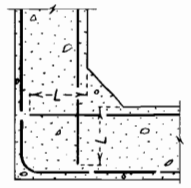



MEMBERS LESS THAN L IN THICKNESS

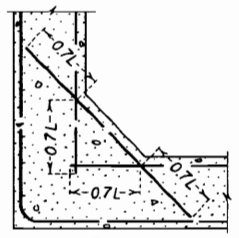



MEMBERS GREATER THAN L IN THICKNESS

TYPICAL CORNER DETAILS

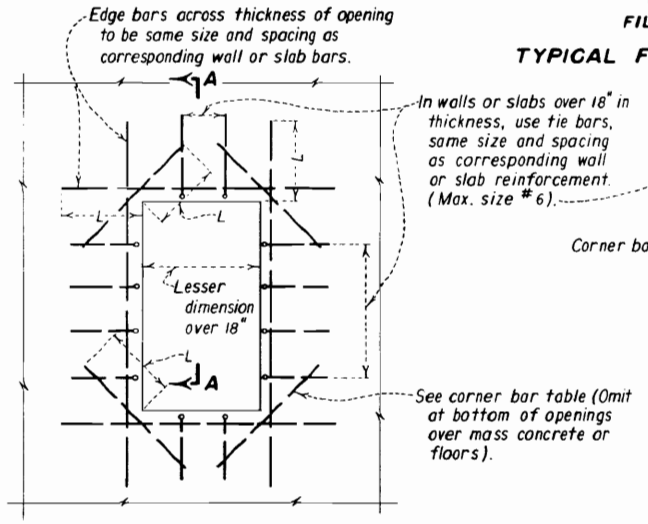


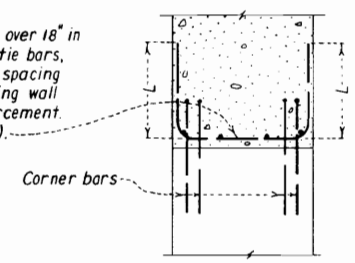

FILLET LESS THAN 12"




FILLET 12" AND GREATER

TYPICAL FILLETED CORNER DETAILS




SECTION A-A

| CORNER BARS | |
|---|---|
| WALL THICKNESS | EACH CORNER (INCLUDES BOTH FACES) |
| 8" or less | 1-#5 |
| 9" Thru 12" | 2-#6 |
| 13" Thru 18" | 2-#8 |
| 19" Thru 24" | 4-#8 |
| 25" Thru 36" | 4-#9 |
| 37" Thru 48" | 4-#10 |
| Over 48" | 4-#11 |

**NOTES**

Ties, edge, and corner bars not required for openings 18" or less. For a recess deeper than 4" but not greater than one half wall or slab thickness, use corner bars in face on recess side.

MINIMUM ADDITIONAL REINFORCEMENT AROUND OPENINGS IN WALLS AND SLABS

# GENERAL NOTES

**UNLESS OTHERWISE SHOWN ON THE REINFORCEMENT DESIGN DRAWINGS, THE DETAILS AND NOTES SHOWN ARE TYPICAL FOR ALL REINFORCEMENT DRAWINGS THAT REFER TO THIS DRAWING.**

**DESIGN:**
Structural design is based on 3000 psi specified compressive concrete strength at 28 days with a working stress of 1,350 psi; and working stresses of 20,000 psi tension in reinforcement with a specified minimum yield strength of 40,000 psi.

**ABBREVIATIONS:**

| | | |
|---|---|---|
| bf = bottom face | br = bottom row | bl = bottom layer |
| tf = top face | tr = top row | tl = top layer |
| nf = near face | nr = near row | ns = near side |
| ff = far face | fr = far row | fs = far side |
| ef = each face | er = each row | es = each side |
| if = inside face | ir = inside row | ew = each way |
| of = outside face | or = outside row | ec = each corner |
| | mr = middle row | ml = middle layer |

spc. = space or spaces
eq. spc. = equally spaced, equal spaces
D = nominal diameter of reinforcing bar
uv = uniformly varying lengths of bars between lengths shown
cl. = clear

**SYMBOLS:**
Bars shown thus —I— #8@12 or — — —I— — — #6@7½, indicate a group of identical bars equally spaced.
o— —An open circle at the end of a bar indicates a bend with the bar turned away from the observer.
•— —A closed circle at the end of a bar indicates a bend with the bar turned towards the observer.
Splices shown thus ▬▬ indicate a lapped splice, not a bend in the bar.

**DIMENSIONS:**
Dimensions are to the center lines of the bars unless otherwise shown. Clear cover dimensions are marked "cl."

**COVER:**
Place the reinforcement so that the clear distance between face of concrete and nearest reinforcement is 1½" for #5 bars and smaller and 2" for #6 bars and larger; except provide a clear distance from face of concrete placed against earth or rock of 2" where member thickness is 9" or less and 3" where member thickness is greater than 9", the clear distance being to the design dimension line.
Reinforcement paralleling construction joints shall have a minimum of 2" clear cover.

**BENT BARS:**
Only billet steel shall be used for bars bent to a radius of 50-bar diameters or less.
Unless larger radius bends are indicated on the design drawings, all reinforcement requiring bending shall be bent around a pin having the following diameter.

| BAR NO. | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 14S | 18S |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Standard Bends Diameter of pin (in.) | 2¼ | 3 | 3¾ | 4½ | 5¼ | 8 | 9 | 12¾ | 14 | 17* | 22½* |
| Stirrup and Tie bends Diameter of pin (in.) | 1½ | 2 | 2½ | 4½ | 5¼ | 8 | 9 | 12¾ | 14 | | |

*Special fabrication for bends exceeding 90° and for all grades of steel with yield point of 50,000 psi or more.

**REINFORCEMENT DOWELS:**
Dowels may be indicated on the drawing thus #8 (d)
Dowels shall have a minimum embedment and projection equal to that required for lap splicing a bar of the same diameter.

**PLAIN DOWELS:**
Plain dowels across contraction joints shall be plain bars painted with one coat of red lead paint. Twist dowels to break bond before final set of first concrete placement. Immediately before the second concrete placement, the projecting half length of dowel shall be uniformly coated with a film of oil. Viscosity of the oil shall have on SAE rating of not less than 250.

**STANDARD HOOKS:**
Hooks shall have 180° bends and extensions of 4-bar diameters but not less than 2½" parallel to the main leg of the bar or 90° bends and extensions of at least 12-bar diameters. Hooks for stirrup and tie anchorage only shall have either a 90° or 135° bend plus an extension of at least 6-bar diameters but not less than 2½" at the free end of the bar. Radius of bend to be as specified in table for bent bars.
A bar (⊃) with a standard 180° hook on one end is referred to as an "A" bar.
A bar (⊂⊃) with a standard 180° hook on both ends is referred to as a "B" bar.

**PLACING:**
Bars at small openings (max. 18") in wall and slabs may be spread apart not more than 1½ times the bar spacing.
Reinforcement may be adjusted in the field to clear waterstops, keys, form ties, anchor bars, seals, recesses, embedded metalwork, and conduits except in heavily reinforced areas. In such cases relocation of the embedded materials must be considered. In no case should bars be bent to greater than 6 to 1 slope.
Where possible, reinforcement shall be placed to maintain a clear distance of at least one inch between the reinforcement and anchor bolts, form ties, or other embedded metalwork.
Reinforcement parallel to anchor bolts or other embedded metalwork shall be placed to maintain a clear distance of at least 1½ times the maximum size aggregate.
Reinforcement not to be placed between or within 4 inches of main power leads.

**SPACING:**
The first and last bars in slabs and walls, stirrups in beams, and ties in columns are to start and end at a maximum of one half of the adjacent bar spacing.

**SPLICES:**
Unless otherwise shown the minimum length of lap for splicing parallel bars shall be as given in Table A.
When reinforcing bars of different size are to be spliced, the lap length shall be governed by the smaller diameter bar.
Splices are to be made so that the given distances to face of concrete will be maintained.
The minimum lap requirement "S" for non-parallel bars shall be as given in Table B.

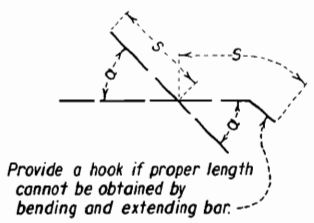
TABLE A
LENGTH OF LAPPED SPLICE "L", IN INCHES*

| BAR NO. | L | BAR NO. | L |
|---|---|---|---|
| #2, #3, #4 | 12 | #8 | 25 |
| #5 | 15 | #9 | 32 |
| #6 | 18 | #10 | 41 |
| #7 | 21 | #11 | 50 |

*Stagger splices if bars are spaced closer than 12 diameters.

TABLE B
LENGTH OF SPLICE "S", FOR NON-PARALLEL BARS

| ANGLE Q | S |
|---|---|
| 0° To 10° | 0.5L |
| 10° To 30° | 0.6L |
| 30° To 50° | 0.7L |
| 50° To 65° | 0.8L |
| 65° To 80° | 0.9L |
| 80° To 90° | 1.0L |




Provide a hook if proper length cannot be obtained by bending and extending bar.

**ACCESSORIES:**
Bar supports, spacers and other accessories are not shown on the design drawings. The recommendations of ACI 315-65 or other approved supporting systems may be used.

**REFERENCES:**
Numerals in parentheses ( ) following notes and section letters or numbers indicate the number of the drawing upon which the section or detail is shown; for example (524) denotes Drawing No. 557-D-524.
Unless otherwise shown follow the recommendations established by American Concrete Institutes "Manual of Standard Practice for Detailing Reinforced Concrete Structures" (ACI 315-65).

ALWAYS THINK SAFETY

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
STANDARD DESIGNS

## GENERAL NOTES AND MINIMUM REQUIREMENTS FOR DETAILING REINFORCEMENT

DRAWN C.R.M.-L.M.C. SUBMITTED Wm. A. Wolf
TRACED W.S. RECOMMENDED K.G. Austin
CHECKED T.E.C.-M.S.-E. APPROVED L. N. Huffman CHIEF ENGINEER

DENVER, COLORADO, MARCH 28, 1966 — 40-D-7004

| | | |
|---|---|---|
| 5-17-68 | CHANGED TITLE, ADDED NOTES, ADDED REFERENCE TO FRANKLIN CANAL RELOCATION AND 10"PIPE CROSSING AT 78+75. | |
| D- Mc[illegible] | | |

ALWAYS THINK SAFETY

UNITED STATES
DEPARTMENT OF THE INTERIOR
Bureau of Reclamation

RIO GRANDE PROJECT-NEW MEXICO-TEXAS

# EXISTING FRANKLIN CANAL

STA. 79+00 TO STA. 135+00

## PLAN AND PROFILE

| | | |
|---|---|---|
| DRAWN | E.R.J. | QUANTITIES |
| TRACED | | RECOMMENDED |
| CHECKED | Zapata | APPROVED |

J. E. Chandler

EL PASO, TEXAS JULY 20, 1956

23-503-5814

## NOTES

Right-of-way: Sta. 79+00 to 129+30± by quitclaim deed from city of El Paso for 26' width (in litigation). Sta. 129+30 to 135+00, no record of title, but 26' width claimed by occupancy. Locations and elevations of all underground pipes and conduits are based on best information available. Additional underground pipes and conduits, for which no data are available, may also exist. In general, overhead power and telephone lines are not shown.

All elevations are on U.S.B.R. Datum, IBWC Datum = U.S.B.R. Datum plus 40.97.

Remove existing concrete lining from station 78+55 to the point where the existing lining crosses the outside toe of the left embankment of the relocation.

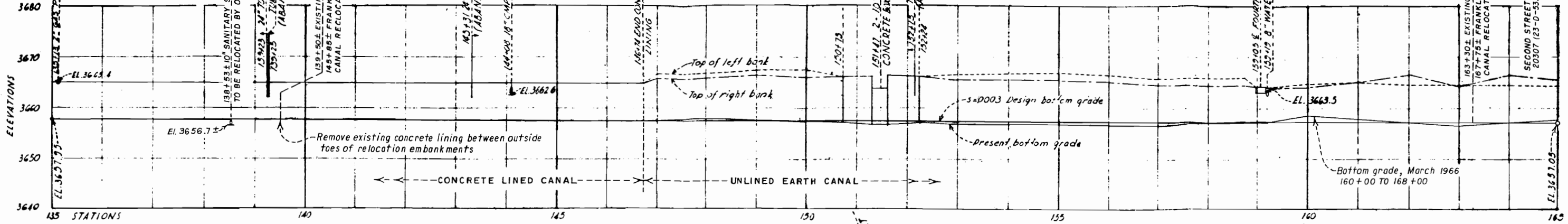
Warp new lining as directed to connect to existing lining at station 78+55

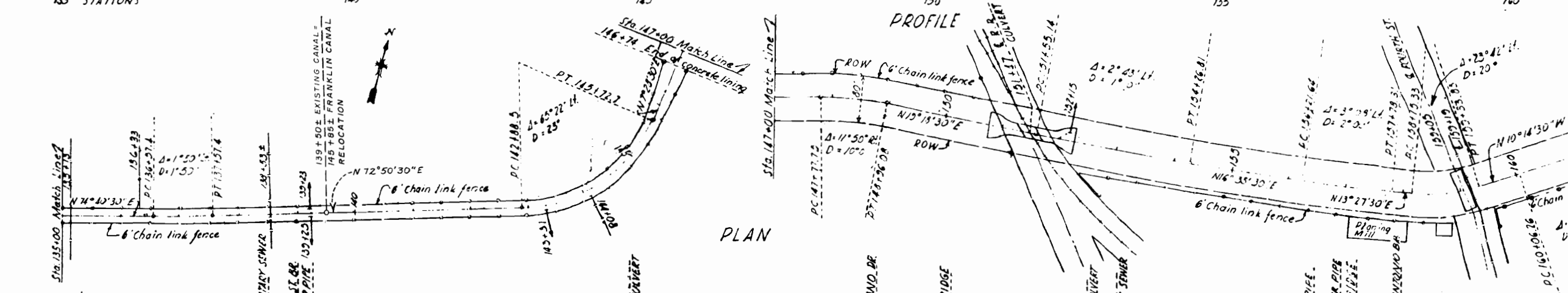
PLAN

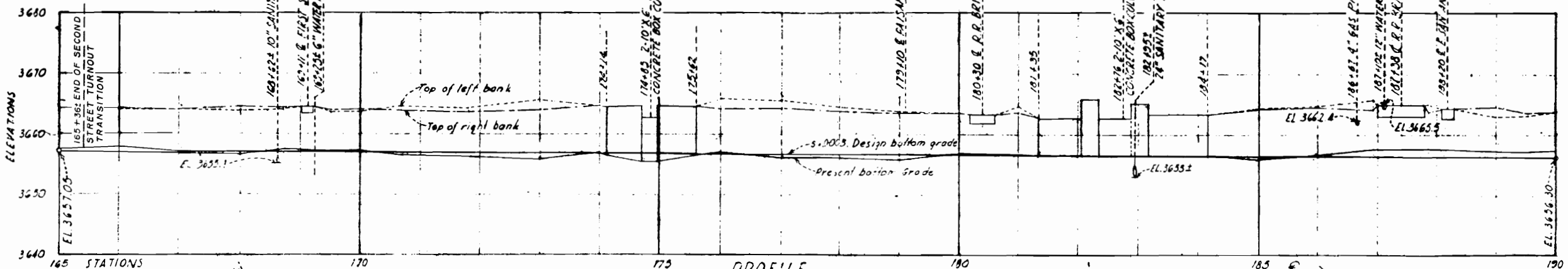
PROFILE

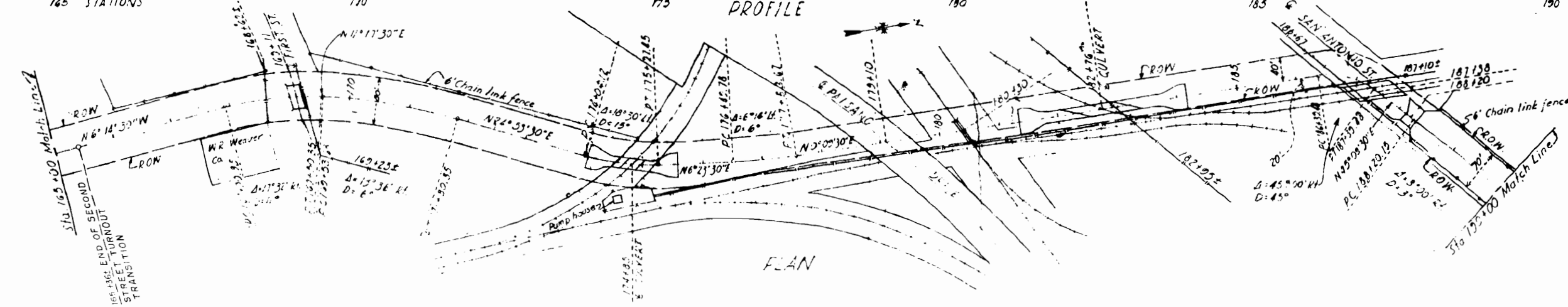
STATIONS

ELEVATION




## NOTES

Right-of-way: Sta. 135+00 to Sta. 188+15 ±. No record title but 26' width from Sta. 135+00 TO Sta. 145+74 ± increases to 48' at Sta. 146+74 ± ; and 80' width from Sta. 146+74 ± Sta. 188+15 ±, excepting railroad rights-of-way, claimed by occupancy.

Sta. 188+15 ± to Sta. 190+00 title by condemnation 35' each side of centerline.

Locations and elevations of all underground pipes and conduits are based on best information available. Additional underground pipes and conduits, for which no data are available, may also exist.

In general, overhead power and telephone lines are not shown.

All elevations are on U.S.B.R. Datum.

IBWC Datum = U.S.B.R. Datum plus 40.97'

ALWAYS THINK **SAFETY**

| | |
|---|---|
| 5-18-66 D 92 | CHANGED TITLE. ADDED NOTES. ADDED REFERENCES TO FRANKLIN CANAL RELOCATION. |

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

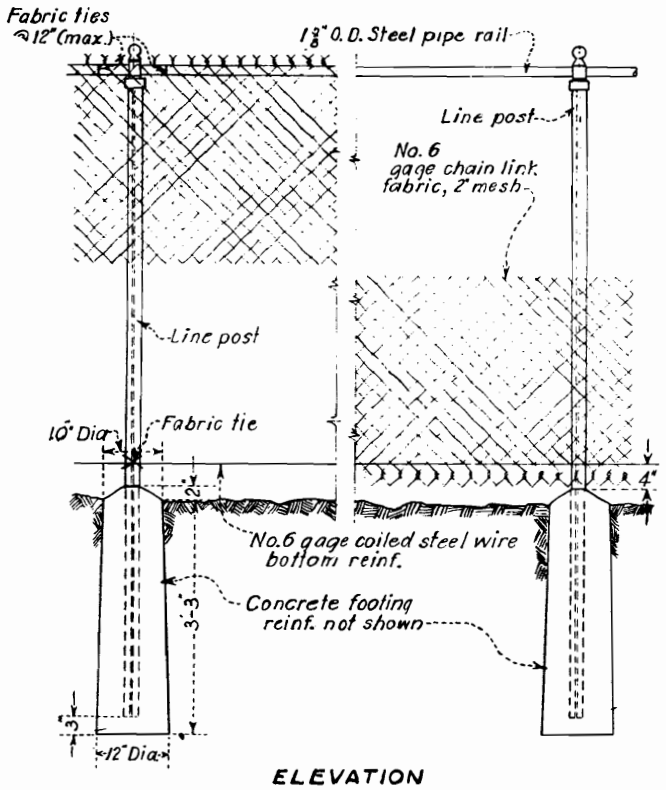
RIO GRANDE PROJECT - NEW MEXICO - TEXAS

# EXISTING FRANKLIN CANAL
## STA. 135+00 TO STA. 190+00
## PLAN AND PROFILE

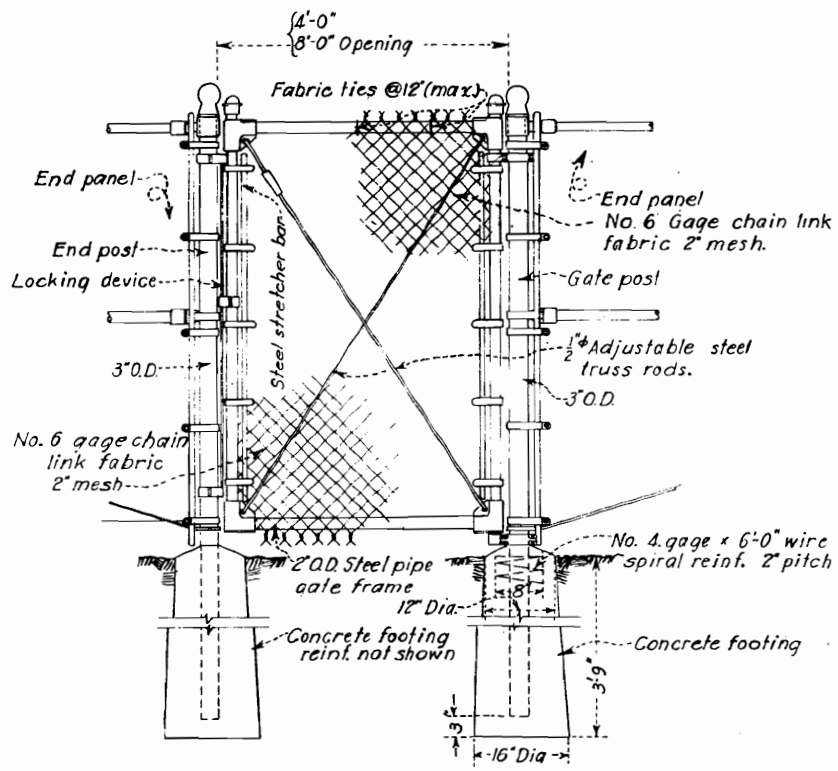
| | | | |
|---|---|---|---|
| DRAWN | R.L.Z. | SUBMITTED | |
| TRACED | | RECOMMENDED | |
| CHECKED | L.H.L. | APPROVED | |

E. TASD. TEX. 35 AUGUST 8, 1956

23-503-581




ELEVATION




GATE

(Not drawn to scale)

4' Gate on right bank at Sta. 143+21.

Canal right of way enclosed by chain-link fence Station 78+51 to Station 146+74.

1 0 1 2 3

SCALE OF FEET.

NOTES

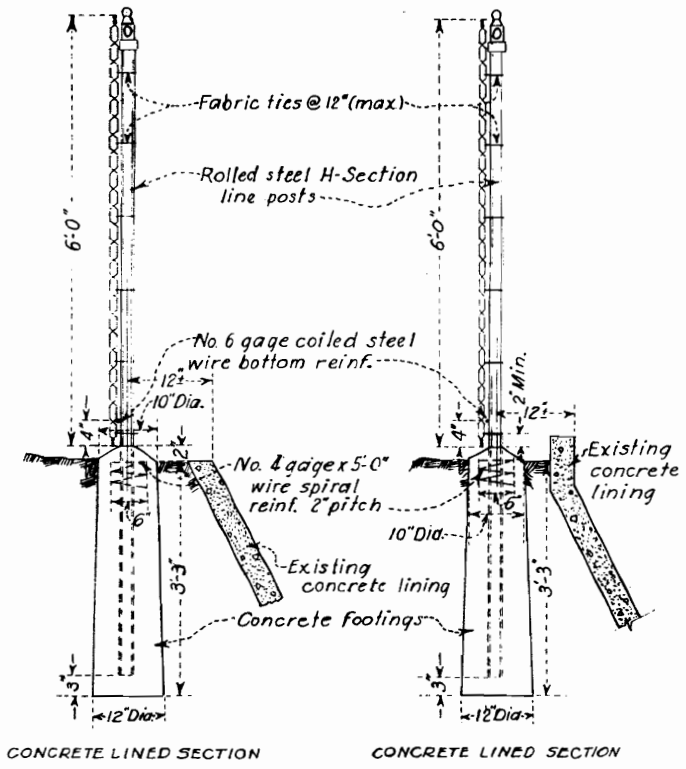
Dimensions and details of sections and fencing were taken from design drawings. Existing dimensions may vary therefrom plus or minus.

This drawing based on field drawing 23-503-5548

Remove all chain link fence between Sta. 78+55 and Sta. 163+30.

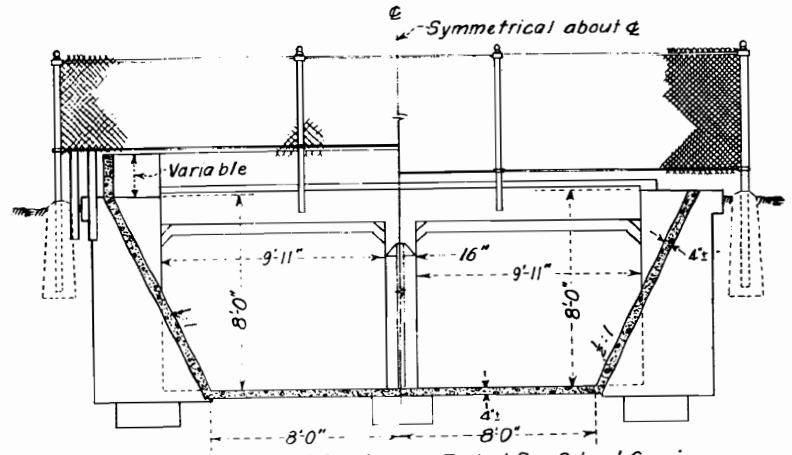
1 0 5 10

SCALE OF FEET



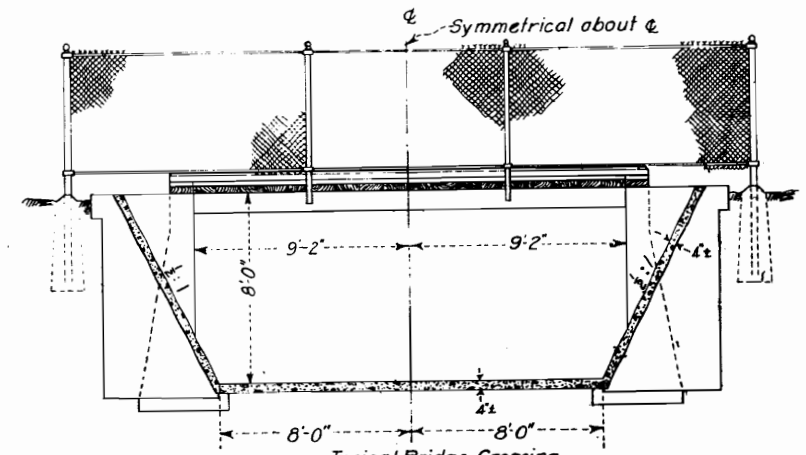

CONCRETE LINED SECTION CONCRETE LINED SECTION

LINE POSTS

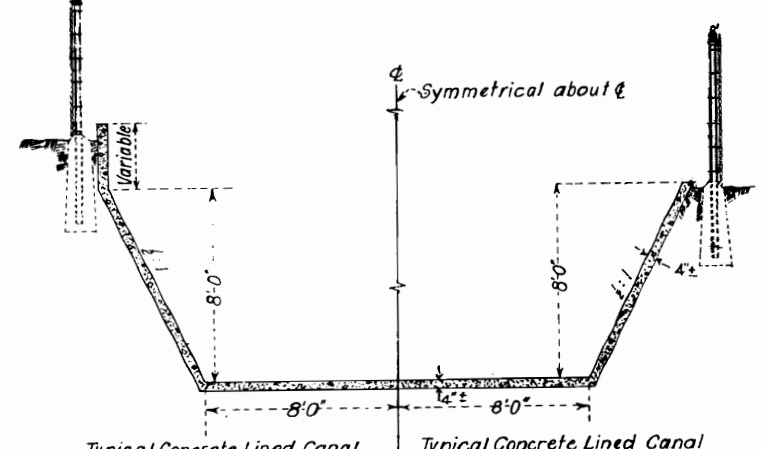



Typical Box Culvert Crossing Sta 78+51 to Sta. 98+51

Typical Box Culvert Crossing Sta. 98+51 to Sta. 146+74.




Typical Bridge Crossing




Typical Concrete Lined Canal Sta. 78+51 to Sta. 98+51

Typical Concrete Lined Canal Sta. 98+51 to Sta 146+74.

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

DRAWN E.R.J.
TRACED E.R.J.
CHECKED G.W.S.M.
SUBMITTED E.R.J.
RECOMMENDED
APPROVED
CHIEF ENGINEER

DENVER, COLORADO MAY 18, 1966

23-D-536

INTERNATIONAL BOUNDARY AND WATER COMMISSION
UNITED STATES AND MEXICO
UNITED STATES SECTION
CHAMIZAL CONVENTION PROJECTS

FRANKLIN CANAL OBLITERATION

EXISTING FRANKLIN CANAL
STA. 78+51 TO STA. 146+74

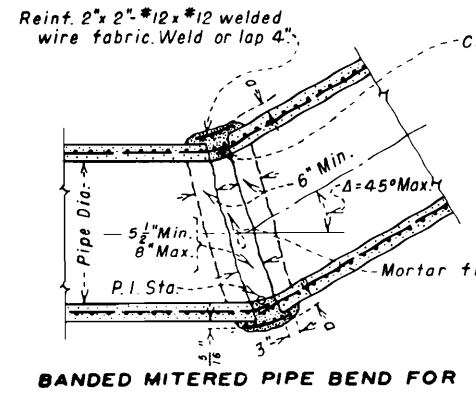
# SECTIONS AND FENCING DETAILS

SUBMITTED Aug. 26 1966 APPROVED Aug. 26 1966

W. E. Walker
PRINCIPAL ENGINEER

COMMISSIONER

EL PASO TEXAS 20310



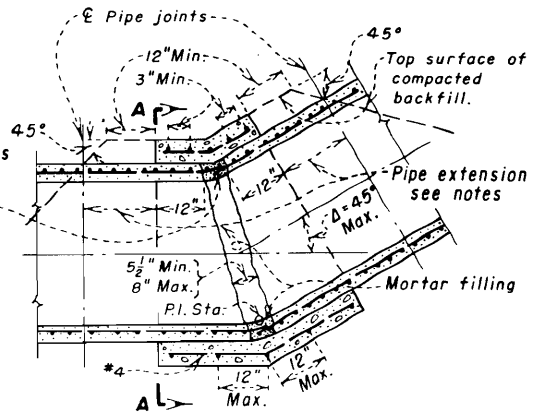

**BANDED MITERED PIPE BEND FOR REINFORCED CONCRETE PRESSURE PIPE**

Circumferential reinf. in bends shall be lapped a minimum of 24 bar diameters or welded. Longitudinal bars shall be lapped a minimum of 5 inches or welded.

BAND THICKNESS DATA

| PIPE DIA (INCHES) | a* |
|---|---|
| 15 | 1 |
| 18 | 1 |
| 24 | 1 |
| 27 | 1 |
| 30 | 1 |
| 36 | 1⅛ |
| | |

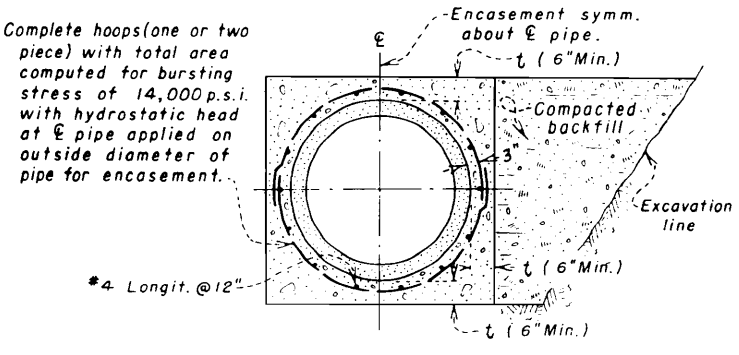
* a = Min. band thickness in inches.




**ENCASED MITERED PIPE BEND FOR REINFORCED CONCRETE PRESSURE PIPE**

## NOTES

Lap all bars 24 diameters at splices, unless otherwise shown.
Unless otherwise shown, place reinforcement so that the clear distance from face of concrete to the nearest reinforcement is 1½".
Compact backfill to top of encasement at all bends.
Elevation of compacted backfill for banded mitered pipe bends shall be the same as the elevation of compacted backfill specified for the adjacent pipe.
Pipe extension shall be 18" max. when D ≤ 36" and ½ D max. when D > 36".
Encase all miter bends when D ≥ 42".




**SECTION A-A**

ALWAYS THINK SAFETY

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

COLUMBIA BASIN PROJECT-WASHINGTON

WAHLUKE BRANCH CANAL LATERALS-BLOCKS 21 & 48

**BENDS FOR PRECAST CONCRETE PRESSURE PIPE**

DRAWN S.E.R. SUBMITTED W.J. Schmidt
TRACED E.V.C. RECOMMENDED D.E. Simpson
CHECKED J.R. for H.W.S. APPROVED A.J. Peterka, CHIEF DESIGNING ENGINEER

DENVER, COLORADO, JULY 21, 1964 — 222-D-21534

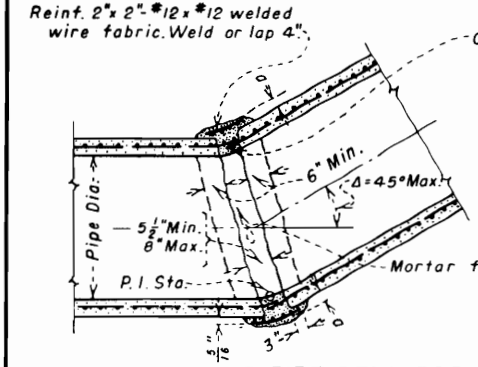
GPO 830-064

RGP 092766

EXHIBIT B

DESCRIPTION:

A tract of land situated immediately left of and adjacent to the United States Rectification Project levee, extending approximately nine and one-half (9.5) miles in length and being approximately one hundred ten (110) feet in width, beginning at a point opposite Rectification Project Station 92 + 53 (metric), being approximately 1,500 linear meters below Hammett Boulevard, and terminating opposite Project Station 245 + 18 at Riverside Heading Diversion Structure, containing approximately 131.0 acres of land, more or less.

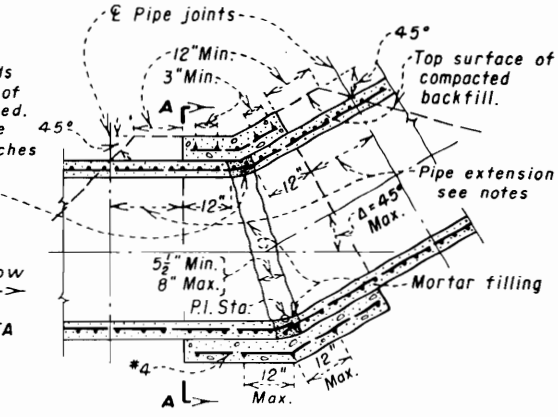



**BANDED MITERED PIPE BEND FOR REINFORCED CONCRETE PRESSURE PIPE**

**BAND THICKNESS DATA**

| PIPE DIA. (INCHES) | ✲ a |
|---|---|
| 15 | 1 |
| 18 | 1 |
| 24 | 1 |
| 27 | 1 |
| 30 | 1 |
| 36 | 1⅛ |
| | |

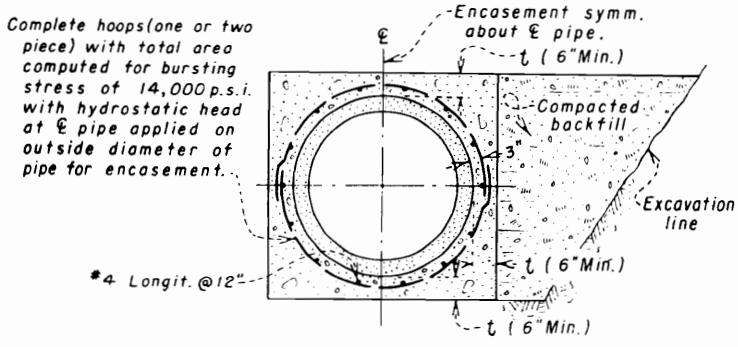
✲ a = Min. band thickness in inches.




**ENCASED MITERED PIPE BEND FOR REINFORCED CONCRETE PRESSURE PIPE**

**NOTES**

Lap all bars 24 diameters at splices, unless otherwise shown.
Unless otherwise shown, place reinforcement so that the clear distance from face of concrete to the nearest reinforcement is 1½".
Compact backfill to top of encasement at all bends.
Elevation of compacted backfill for banded mitered pipe bends shall be the same as the elevation of compacted backfill specified for the adjacent pipe.
Pipe extension shall be 18" max. when D ≤ 36" and ½ D max. when D > 36".
Encase all miter bends when D ≥ 42".




**SECTION A-A**

ALWAYS THINK SAFETY

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

COLUMBIA BASIN PROJECT-WASHINGTON
WAHLUKE BRANCH CANAL LATERALS-BLOCKS 21 & 48

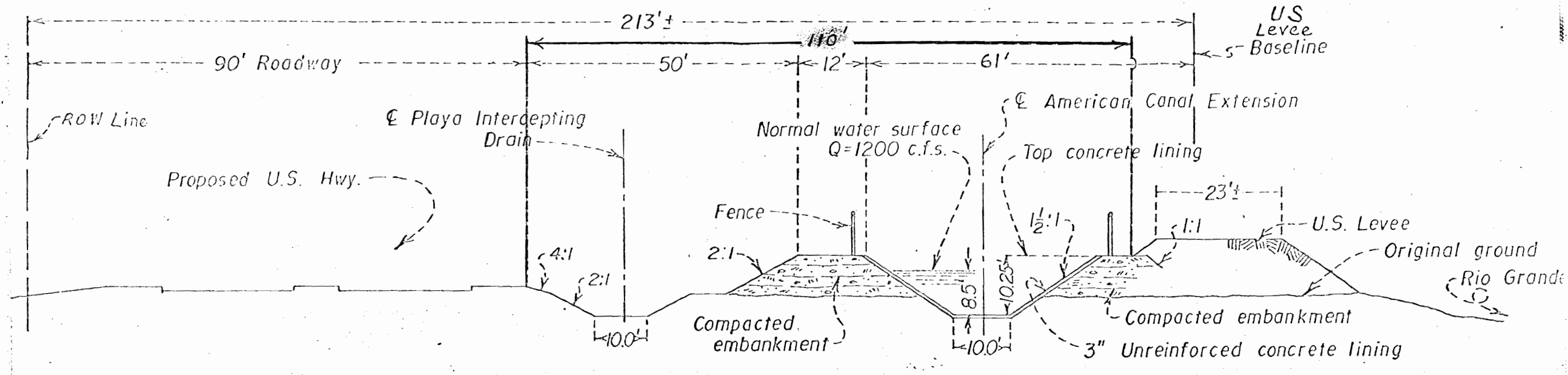
**BENDS FOR PRECAST CONCRETE PRESSURE PIPE**

DRAWN S.E.R. SUBMITTED W.J. Schmidt
TRACED E.V.C. RECOMMENDED J.E. Rippon
CHECKED J.A.R. July 21 1964 APPROVED A.P. Ahlin CHIEF DESIGNING ENGINEER

DENVER, COLORADO, JULY 21, 1964 | 222-D-21534

GPO 830-064

EXHIBIT C




10 0 10 20 30 40 50
SCALE OF FEET

TYPICAL SECTION OF OPEN CANAL
FROM END OF CHAMIZAL PROJECT TO RIVERSIDE HEADING

HYDRAULIC PROPERTIES

| Q | A | V | r | n | s |
|---|---|---|---|---|---|
| 1200 | 193.4 | 6.20 | 4.76 | .014 | -.00043 |

AMERICAN CANAL EXTENSION

#14-06-503-795
IBWC

INTERNATIONAL BOUNDARY AND WATER COMMISSION
UNITED STATES AND MEXICO

OFFICE OF THE COMMISSIONER
UNITED STATES SECTION

1889-1989
CENTENNIAL

BUREAU OF RECLAMATION
EL PASO, TEXAS
APR 21 '89

| ROUTE TO | | INITIALS |
|---|---|---|
| RG - 100 | | |
| RG - 101 | | |
| SAFETY | | |
| EEO BOARD | | |
| EEO OFFICE | | |
| RG - 110 | ✓ | |
| RG - 111 | | |
| RG - 112 | ✓ | |
| RG - 400 | ✓ | |
| | | |
| | | |
| | | |

Ms. Pauley Nez
Bureau of Reclamation
Rio Grande Project
700 E. San Antonio, Rm. B318
El Paso, Texas 79901

Dear Ms. Nez:

Enclosed is a copy, for your records, of an agreement between the International Boundary and Water Commission, U.S. Section and the Bureau of Reclamation regarding the shared communications site on Caballo Mountain. We received this information from the Bureau of Land Management Office in Las Cruces. It would seem to indicate that the building is yours.

Hope this serves to clarify your recent conversations with Steve Smullen of my staff.

Sincerely,

C. W. Ruth
Division Engineer

Enclosure:
As Stated

The Commons, Building C, Suite 310 • 4171 North Mesa Street • El Paso, Texas 79902
(915) 534-6700 • (FTS) 570-6700

DUPLICATE

Contract No. 14-06-503-795

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
RIO GRANDE PROJECT - NEW MEXICO-TEXAS

THIS MEMORANDUM OF AGREEMENT, made this 10th day of September, 1959, in pursuance of the Act of June 17, 1902 (32 Stat. 388) and acts amendatory thereof or supplementary thereto, and Section 601 of the Economy Act of June 30, 1932, between the BUREAU OF RECLAMATION, hereinafter styled the Bureau, represented by the officer executing this agreement and the INTERNATIONAL BOUNDARY AND WATER COMMISSION, UNITED STATES AND MEXICO, UNITED STATES SECTION, hereinafter styled the Commission, represented by the officer executing this agreement.

WITNESSETH THAT:

WHEREAS, the Commission proposes to install and operate a radio repeater station on Caballo Mountain in connection with its operations, and will require space for said installation; and

WHEREAS, the Bureau now has a site and a building on Caballo Mountain, as shown on drawing attached hereto and made a part hereof, designated "Exhibit A", at which it is operating a radio repeater station, and, as a result of elimination of its need for power generating equipment, is able to provide space for the Commission's station.

NOW, THEREFORE, the parties hereto agree as follows:

1. The Bureau will provide approximately eighteen (18) square feet of floor space in its radio repeater station building for the installation by the Commission of its radio equipment, location of said space to be mutually agreeable to the parties hereto.

2. The Bureau will permit the Commission to erect a pole near said building, within the Bureau's 200 feet by 200 feet lot, for the installation of an antenna or antennas, said pole location to be mutually agreeable to the parties hereto.

3. The Commission agrees that, in the event its radio repeater station installation creates or causes interference with the Bureau's station operations, the Commission will take whatever steps are required to eliminate such interference.

4. The Commission recognizes the right of the Bureau to have complete access to the building and premises, including areas to be used by the Commission.

5. The Commission shall make its own arrangements for a power supply for its station operations.

6. Necessary minor drilling or cutting of the building walls or floor shall be permitted in connection with the installation of the Commission's equipment, power supply and related items. No major changes shall be made to the building without the prior consent of the Bureau.

7. This agreement may be terminated by either party upon thirty (30) days written notice to the other. In the event of such termination, the Commission shall be permitted reasonable time to provide other facilities in lieu of those herein provided, including reasonable time to remove its equipment.

IN WITNESS WHEREOF, the parties hereto have executed this agreement as of the day and year first above written.

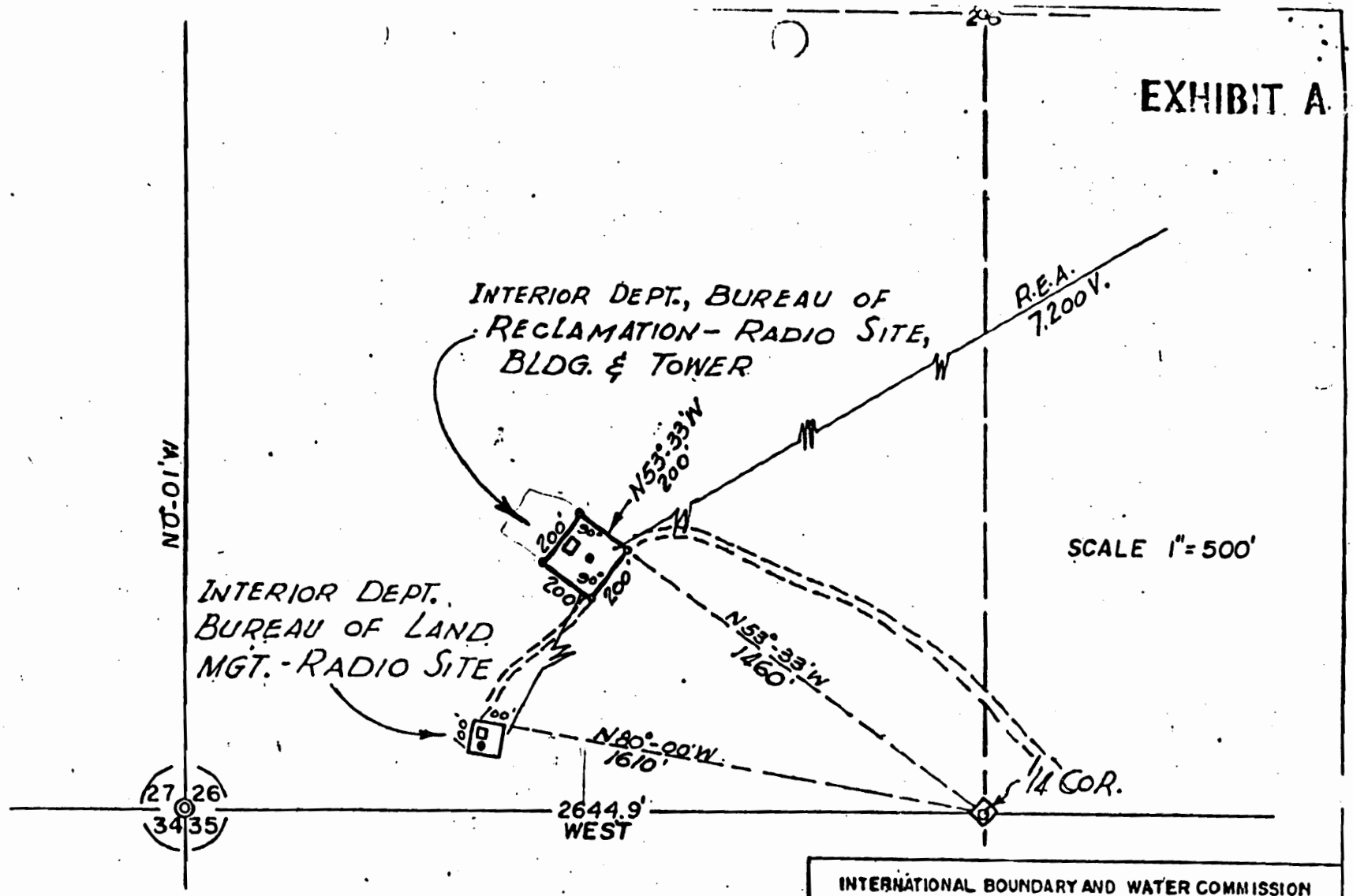
BUREAU OF RECLAMATION

By W. F. Resch
W.F. Resch, Project Manager
Rio Grande Project
211 U.S. Court House
El Paso, Texas

INTERNATIONAL BOUNDARY AND WATER COMMISSION, UNITED STATES AND MEXICO, UNITED STATES SECTION

BY
L. H. Hewitt, Commissioner

# EXHIBIT A

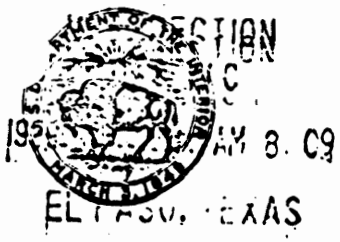



SW 1/4, SEC. 26, T15S, R4W, N.M.P.M.

EXHIBIT A

INTERNATIONAL BOUNDARY AND WATER COMMISSION
UNITED STATES AND MEXICO
UNITED STATES SECTION
RIO GRANDE CANALIZATION PROJECT
CABALLO MOUNTAIN RADIO
COMM. INSTALLATIONS

DRAWN A.F.B. RECOMMENDED _____
EL PASO, TEX. 6-30-'59
No. AD 28-10.9



IN REPLY REFER TO:

# UNITED STATES
# DEPARTMENT OF THE INTERIOR
## BUREAU OF LAND MANAGEMENT
STATE OFFICE
P. O. Box 1251
Santa Fe, New Mexico

NM 070631
Right-of-Way

4.20e

SEP 3 - 1959

1 COMMR
SECY.
P.E.(S)
P.E.(P)
COUNSEL
ASST. C.
5 REALTY O. W
A.O.
ADM. ASST.
CHIEF DAK
3 ENGR. B. CB
4 PROJ. 97B
ENGR. BR.
OFFICE E.
O.W.C.
PURCHASING
PETR. MGMT.
SUPV.
ACCTS.
6 C. E. R.
ACTION BY

International Boundary and Water Commission
United States and Mexico
P. O. Box 1859
El Paso, Texas

Gentlemen:

The Bureau of Land Management interposes no objection to joint use of site and building now occupied by Bureau of Reclamation in SW¼ Sec. 26, T. 15 S., R. 4 W., N. Mex. Prin. Mer., New Mexico.

The Land Office records have been noted as to the above, and serial number, New Mexico 070631, has been assigned.

Sincerely yours,

E. R. Smith
State Supervisor

By Ernest L. Brown
Acting

What Bldg is this?
Caballo Repeater site

INTERNATIONAL BOUNDARY AND WATER COMMISSION
UNITED STATES AND MEXICO
208 SAN FRANCISCO STREET
EL PASO, TEXAS

OFFICE OF THE COMMISSIONER
UNITED STATES SECTION

MAILING ADDRESS:
P. O. BOX 1859

JUL 9 1963

Mr. Chesley P. Seely,
State Director,
United States Department of the Interior,
Bureau of Land Management,
P. O. Box 1251,
Santa Fe, New Mexico.

Dear Mr. Seely:

The building on Caballo Mountain, to which you refer in your letter of July 3, 1963, is one which we presently share with the Bureau of Reclamation and use for a repeater installation. Use of the building for this purpose was approved by your office by letter of September 3, 1959. A copy of this letter is enclosed for your ready reference. Also enclosed is Contract No. 14-06-503-795, which is a memorandum agreement between this Agency and the Bureau of Reclamation.

Please do not hesitate to call on us if we can furnish any further information.

Sincerely,

J. F. Friedkin
Commissioner

RECEIVED
BUR. OF LAND MANAGEMENT
JUL 10 AM 8:10
SANTA FE, NEW MEXICO

Encl: Contract No. 14-06-503-795
Letter of 9-3-59

Date Routed JUL 10 1963

Initials

| | | |
|---|---|---|
| 1 | SD | For: |
| | Adm | |
| | Engrg | Info ✓ |
| | I&E | |
| | L&M | Review |
| | LC | |
| | R&F | Comment |
| S | File | Action |

Department of the Interior
Bureau of Reclamation
Rio Grande Project - New Mexico-Texas

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SOIL CONSERVATION SERVICE


| Date | Contract | Tab |
|---|---|---|
| May 15, 1950 | Bureau of Reclamation, and Soil Conservation Service<br>Flood Control, Lucero Arroyo area<br>Contract No. I78r-339 | 1 |
| May 16, 1957 | Bureau of Reclamation, and Soil Conservation Service<br>Use of Bureau survey party, flood control, Dona Ana Arroyos<br>Contract 14-06-503-508 | 2 |
| Jan. 2, 1958 | Bureau of Reclamation, and Soil Conservation Service<br>Use of Bureau survey party, flood control, Dona Ana Arroyos<br>Contract No. 14-06-503-561 | 3 |

Contract No. 178r-339

MEMORANDUM OF UNDERSTANDING
Between the
UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION, REGION 5
and the
UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE, STATE OF NEW MEXICO

This Memorandum of Understanding is entered into as of this 15th day of May, 1950 between the DEPARTMENT OF THE INTERIOR, BUREAU OF RECLAMATION, herein styled the Bureau represented by the Regional Director, Region 5, and the DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE, hereinafter designated the Service represented by the State Conservationist of the State of New Mexico.

WITNESSETH THAT:

2. WHEREAS, the Bureau is responsible for conservation of soil and moisture resources of public lands administered by it and in that connection is now concerned with conservation service for the Rio Grande Project in New Mexico, and -

3. WHEREAS, the Service is qualified in personnel, equipment, and experience to develop and prepare conservation plans and surveys,

NOW THEREFORE, it is agreed by and between the parties hereto as follows:

4. The Service agrees to investigate and prepare general plans and surveys as requested by the Bureau for flood control in the Lucero Arroyo area, and for the conservation and protection of lands and structures in the Rio Grande Project, New Mexico Division, administered by the Bureau as indicated on plat No. 4791G dated August, 1947, attached hereto and made a part hereof. Such plans and surveys shall include topographic surveys of a dam and reservoir location, profiles of wasteway locations and detail topography of structure sites. Detail plans, designs and cost estimates are not to be made by the Service.

5. The Bureau agrees to pay the Service the actual cost of preparing the plans and surveys outlined in Article 4 above, which payment shall be effected by a transfer of appropriations. The costs incurred shall be certified by the Service to the Bureau as follows:

Personnel engaged in the work: Actual salary plus 12% for leave earned.
Travel: Current Service per diem rates, plus current Government common carrier charges if necessary in the work.
Transportation equipment: $.06 per mile for the use of all

transportation equipment necessary in the work.
Materials and Supplies: Actual cost to the Service.

The total cost of the work to be performed under this memorandum shall not exceed $1,000.00, payment will be made by the Bureau upon appropriate billing by the Service.

6. The Service shall keep and maintain adequate records and accounts of all costs incurred in preparing plans and surveys hereunder and the Bureau shall be provided with all or any portions of such information requested by it in writing of the Service.

7. The Bureau may cancel this agreement at any time by giving thirty days notice in writing to the Service, but such cancellation will not relieve the Bureau from payment of amounts due the Service for work performed and costs incurred to the time of its cancellation.

8. This memorandum shall be effective immediately on execution and shall continue until all work contemplated thereunder is completed or until June 30, 1950, whichever shall occur first.

IN WITNESS WHEREOF The parties hereunder have affixed their names the day and year first hereinabove written.

DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

By /s/ H. E. Robbins
Regional Director, Region 5

DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

By /s/ J. V. Taylor
State Conservationist
State of New Mexico

Contract 14-06-503-508

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
RIO GRANDE PROJECT - NEW MEXICO-TEXAS

MEMORANDUM OF AGREEMENT BETWEEN THE BUREAU OF RECLAMATION,
DEPARTMENT OF THE INTERIOR
AND
SOIL CONSERVATION SERVICE, DEPARTMENT OF AGRICULTURE

THIS AGREEMENT entered into this 16th day of May, 1957, in pursuance of the Act of Congress of June 17, 1902 (32 Stat. 388) and acts amendatory thereof and supplementary thereto, and the Act of June 30, 1932 (47 Stat. 382, 417) by and between the BUREAU OF RECLAMATION of the DEPARTMENT OF INTERIOR, hereinafter referred to as the Bureau, represented by the officer executing this agreement; and the SOIL CONSERVATION SERVICE of the DEPARTMENT OF AGRICULTURE, hereinafter referred to as the Service, represented by the officer executing this agreement.

WITNESSETH THAT:

2. WHEREAS, the Service, in accordance with provisions of the Watershed Protection and Flood Prevention Act (Public Law 566, 83rd Congress, 68 Stat. 666, and amendments thereto), has authority to provide engineering services to sponsors of projects carried out under this act, and the Elephant Butte Irrigation District is sponsoring the Dona Ana Arroyo Watershed Protection Project, which will include the construction of two floodwater retarding dams on the Dona Ana Arroyos in the vicinity of Las Cruces, New Mexico, for the control and prevention of floods that have in the past damaged repayment land in the Elephant Butte Irrigation District of the Rio Grande Project of the Bureau of Reclamation, and

3. WHEREAS, the Bureau has available, and the Service desires to utilize, certain engineering survey personnel in the vicinity of Las Cruces, New Mexico.

NOW, THEREFORE, the parties hereto agree as follows:

4. The Bureau will at such times as its own needs permit, make available to the Service, not to exceed three days per week during the term of this agreement, a survey party consisting of a Chief of Party and one or more assistants, as needed. The Project Manager of the Rio Grande Project, or his representative, will determine the days each week on which the survey party will be available to the Service. The survey party on such days will, under the direction and

supervision of engineers of the Service, survey and stake out certain dams, channels and appurtenant structures contemplated in a report entitled "Work Plan, Dona Ana Arroyo Watershed Protection Project, Dona Ana County, New Mexico".

5. The Bureau's Chief of Party or his assistants will not undertake to change any plans, specifications, procedures, or engineering details of facilities to be constructed in the Dona Ana Arroyo Program.

6. The Service will reimburse the actual cost to the Bureau of the engineering survey party upon receipt of the Bureau's voucher on Standard Form 1080. The costs incurred shall be certified to the Service as follows:

Personnel engaged in the work: actual salary and overtime, if any.

Transportation: $0.07 per mile for the use of all transportation equipment utilized in furnishing engineering services.

Materials and supplies: actual cost to the Bureau

Overhead costs in the amount of 25 percent to be applied to all costs incurred under the terms of this agreement.

7. The Bureau shall maintain adequate records and accounts of all costs incurred in furnishing services heretofore described and furnish all or any portion of such information to the Service upon request in writing.

8. This agreement shall become effective immediately upon the execution by the parties and shall continue until completion of the planned work, but in no event shall the agreement continue beyond December 31, 1957.

9. This agreement may be terminated by either party upon thirty (30) days' notice in writing to the other party. Termination shall in no way relieve the Service of obligations to pay for services furnished and costs incurred to the date of termination.

10. The Service is responsible for all work under the Dona Ana Arroyo Watershed Protection Program, and utilization of Bureau personnel under this agreement in nowise affects that responsibility.

11. The Service hereby agrees to hold the Bureau harmless from responsibility for loss or damage of any nature whatsoever which may arise from acts of members of the Bureau's survey party in the course of their employment on the Dona Ana Arroyo Program, including the time of their travel to and from the Bureau's headquarters at Las Cruces, New Mexico.

IN WITNESS WHEREOF, the parties have executed this instrument as of the day and year first above written.

BUREAU OF RECLAMATION

By /s/ W. F. Resch

Title Project Manager,
Rio Grande Project
Bureau of Reclamation

SOIL CONSERVATION SERVICE

By /s/ R. A. Young

Title State Conservationist

Contract 14-06-503-561

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
RIO GRANDE PROJECT - NEW MEXICO-TEXAS

MEMORANDUM OF AGREEMENT BETWEEN THE BUREAU OF RECLAMATION,
DEPARTMENT OF THE INTERIOR
AND
SOIL CONSERVATION SERVICE, DEPARTMENT OF AGRICULTURE

THIS AGREEMENT entered into this 2nd day of January, 1958, in pursuance of the Act of Congress of June 17, 1902 (32 Stat. 388) and acts amendatory thereof and supplementary thereto, and the Act of June 30, 1932 (47 Stat. 382, 417) by and between the BUREAU OF RECLAMATION of the DEPARTMENT OF INTERIOR, hereinafter referred to as the Bureau, represented by the officer executing this agreement; and the SOIL CONSERVATION SERVICE of the DEPARTMENT OF AGRICULTURE, hereinafter referred to as the Service, represented by the officer executing this agreement.

WITNESSETH THAT:

2. WHEREAS, the Service, in accordance with provisions of the Watershed Protection and Flood Prevention Act (Public Law 566, 83rd Congress, 68 Stat. 666, and amendments thereto), has authority to provide engineering services to sponsors of projects carried out under this act, and the Elephant Butte Irrigation District is sponsoring the Dona Ana Arroyo Watershed Protection Project, which will include the construction of two floodwater retarding dams on the Dona Ana Arroyos in the vicinity of Las Cruces, New Mexico, for the control and prevention of floods that have in the past damaged repayment land in the Elephant Butte Irrigation District of the Rio Grande Project of the Bureau of Reclamation, and

3. WHEREAS, the Bureau has available, and the Service desires to utilize, certain engineering survey personnel in the vicinity of Las Cruces, New Mexico.

NOW, THEREFORE, the parties hereto agree as follows:

4. The Bureau will at such times as its own needs permit, make available to the Service, not to exceed three days per week during the term of this agreement, a survey party consisting of a Chief of Party and one or more assistants, as needed. The Project Manager of the Rio Grande Project, or his representative, will determine the days each week on which the survey party will be available to the Service. The survey party on such days will, under the direction and

supervision of engineers of the Service, survey and stake out certain dams, channels and appurtenant structures contemplated in a report entitled "Work Plan, Dona Ana Arroyo Watershed Protection Project, Dona Ana County, New Mexico".

5. The Bureau's Chief of Party or his assistants will not undertake to change any plans, specifications, procedures, or engineering details of facilities to be constructed in the Dona Ana Arroyo Program.

6. The Service will reimburse the actual cost to the Bureau of the engineering survey party upon receipt of the Bureau's voucher on Standard Form 1080. The costs incurred shall be certified to the Service as follows:

Personnel engaged in the work: actual salary and overtime, if any.

Transportation: $0.07 per mile for the use of all transportation equipment utilized in furnishing engineering services.

Materials and supplies: actual cost to the Bureau.

Overhead costs in the amount of 25 percent to be applied to all costs incurred under the terms of this agreement.

7. The Bureau shall maintain adequate records and accounts of all costs incurred in furnishing services heretofore described and furnish all or any portion of such information to the Service upon request in writing.

8. This agreement shall become effective immediately upon the execution by the parties and shall continue until completion of the planned work, but in no event shall the agreement continue beyond June 30, 1958.

9. This agreement may be terminated by either party upon thirty (30) days' notice in writing to the other party. Termination shall in no way relieve the Service of obligations to pay for services furnished and costs incurred to the date of termination.

10. The Service is responsible for all work under the Dona Ana Arroyo Watershed Protection Program, and utilization of Bureau personnel under this agreement in nowise affects that responsibility.

11. The Service hereby agrees to hold the Bureau harmless from responsibility for loss or damage of any nature whatsoever which may arise from acts of members of the Bureau's survey party in the course of their employment on the Dona Ana Arroyo Program, including the time of their travel to and from the Bureau's headquarters at Las Cruces, New Mexico.

IN WITNESS WHEREOF, the parties have executed this instrument as of the day and year first above written.

BUREAU OF RECLAMATION

/s/ W. F. Resch

By _____
W. F. Resch

Title Project Manager,
Rio Grande Project
Bureau of Reclamation

SOIL CONSERVATION SERVICE

/s/ R. A. Young

By _____

Title State Conservationist

Department of the Interior
Bureau of Reclamation
Rio Grande Project - New Mexico-Texas

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GEOLOGICAL SURVEY


| Date | Contract | Tab |
|---|---|---|
| Dec. 1, 1949 | Transfer and Operation of Elephant Butte Gaging Station, between Bur. of Recl. and Geological Survey-New Mex. District | 1 |

MEMORANDUM OF UNDERSTANDING

between

BUREAU OF RECLAMATION-RIO GRANDE PROJECT

and

GEOLOGICAL SURVEY-NEW MEXICO DISTRICT

**Dated December 1, 1949**

Transfer and Operation of
Elephant Butte River Gaging Station

MEMORANDUM OF UNDERSTANDING

Between

BUREAU OF RECLAMATION - RIO GRANDE PROJECT
AND
GEOLOGICAL SURVEY - NEW MEXICO DISTRICT
UNITED STATES DEPARTMENT OF THE INTERIOR

THIS MEMORANDUM OF UNDERSTANDING, made this 1st day of December 1949, in pursuance of the Act of June 17, 1902 (32 Stat. 388) and Acts amendatory thereof or supplementary thereto, and Section 601 of the Economy Act of June 30, 1932, between the Bureau of Reclamation, herein styled the Bureau, represented by the Project Manager of the Rio Grande Project, and the Geological Survey, herein styled the Survey, represented by the District Engineer of the Santa Fe district.

WITNESSETH THAT:

2. WHEREAS, the Bureau has constructed a gaging station below Elephant Butte dam designated as the "Rio Grande below Elephant Butte dam gaging station", and

3. WHEREAS, the "Rio Grande below Elephant Butte dam gaging station" has been designated by the Rio Grande Compact Commission as the index station for determination of inflow into Elephant Butte reservoir, in lieu of the Rio Grande San Marcial Gaging Station, and the Survey is qualified to operate and maintain such a gaging station,

NOW THEREFORE, the parties hereto agree as follows:

4. The Bureau agrees to transfer to the Survey the following equipment and facilities which constitute the existing "Rio Grande below Elephant Butte dam gaging station":

1 - Wooden recording gauge shelter
1 - Cable measuring station with sit-down car

5. The Survey agrees to operate and maintain the existing "Rio Grande below Elephant Butte dam gaging station" using such of the present station facilities and equipment as it may desire, beginning December 1, 1949.

6. The Survey agrees to furnish the Bureau the following data and records resulting from the operation and maintenance of the station by the Survey, beginning December 1, 1949:

(a) Preliminary daily discharge data to be provided the Bureau monthly, not later than the 11th of the following month; final daily discharge records for calendar year by February 1st of year following close of records December 31.

(b) Discharge measurement results (gage height and discharge) as made, and annual list of checked measurements.

(c) Prints of water stage recorder charts when requested.

(d) Access to cable station, and water stage recorder shelter whenever necessary for current meter measurements and gage height reading in connection with investigations or studies by Bureau. Keys to station locks to be provided Bureau.

7. At irregular intervals, the Bureau may deem it necessary to make independent current meter measurements for its particular requirements. In such instances, the Bureau agrees to furnish the Survey with copies of such measurement notes as are made.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement the day and year first above written.

BUREAU OF RECLAMATION - RIO GRANDE PROJECT

By /s/ L. R. Fiock
Project Manager

GEOLOGICAL SURVEY

By /s/ Berkeley Johnson
District Engineer
New Mexico District

Department of the Interior
Bureau of Reclamation
Rio Grande Project - New Mexico-Texas

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Grazing Service (Bureau of Land Management)


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| Oct. 5, 1942<br><br>(See final list of Oct. 24, 1952) | Supplemental Memorandum of Understanding Between Bureau of Reclamation and Grazing Service (CABALLO)<br>Administration of Grazing Privileges on Caballo Reservoir Lands | 2 |
| June 1, 1948<br><br>(Approved May 6, 1949) | Supplemental Memorandum of Understanding Between Bureau of Reclamation and Bureau of Land Management (EL. BUTTE)<br>Administration of Grazing Privileges on Elephant Butte Reservoir Lands | 3 |
| Sept. 18, 1952 | Memorandum of Agreement Between Bureau of Reclamation and Bureau of Land Management X<br>Transfer of funds in connection with Picacho Arroyo Control Program | 4 |
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| July 17, 1964 | Supplemental Memorandum of Understanding No. 2 Between Bureau of Land Management and Bureau of Reclamation (EL. BUTTE)<br>Supplement to one dated Apr. 29, 1941, See Tab 1 | 7 |
| Nov. 24, 1970 | Memorandum of Agreement Between Bureau of Land Management and Bureau of Reclamation for Wildlife habitat for Mexican Ducks(Anas diazi) | 8 |

Department of the Interior
Bureau of Reclamation
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| Nov. 16, 1987 | Supplemental Memorandum of Understanding for administration of certain grazing lands Document No. 8-AA-54-07020 | 10 |

# MEMORANDUM OF UNDERSTANDING FOR COOPERATION

Between

THE BUREAU OF RECLAMATION

And

THE GRAZING SERVICE

For Range Administration of Lands
Withdrawn for Reclamation Purposes

Approved April 29, 1941

MEMORANDUM OF UNDERSTANDING FOR COOPERATION BETWEEN THE BUREAU OF RECLAMATION AND THE GRAZING SERVICE, DEPARTMENT OF THE INTERIOR, FOR RANGE ADMINISTRATION OF LANDS WITHDRAWN FOR RECLAMATION PURPOSES.

Pursuant to the act of June 17, 1902 (32 Stat. 388), and acts amendatory thereof or supplementary thereto (hereinafter referred to as the Federal Reclamation Laws) and to section 12 of the Taylor Grazing Act of June 28, 1934 (48 Stat. 1269), as amended, it is hereby agreed and understood between the Bureau of Reclamation and the Grazing Service, Department of the Interior, as follows:

1. Whereas many of the lands withdrawn for reclamation purposes under the Federal Reclamation Laws, prior to the time when they are needed in connection with the construction or operation and maintenance of a reclamation project, can best be utilized for the grazing of livestock; and

2. Whereas many of such withdrawn lands are or may be located within the exterior boundaries of grazing districts established under the Taylor Grazing Act of June 28, 1934 (48 Stat. 1269), as amended, without being a part of a grazing district, the Secretary of the Interior not having approved the inclusion of them in a district; and

3. Whereas range administration of such withdrawn lands can best be effected by the Grazing Service, particularly since the same stock grazes part time on grazing-district lands and part time on such withdrawn lands; and

4. Whereas the grazing fees fixed by the Secretary of the Interior for the use of grazing-district lands adjacent to such withdrawal and of similar value for grazing purposes are adequate to provide a reasonable return to the Reclamation fund for the use of most of such withdrawn lands.

5. The Bureau of Reclamation will, from time to time, submit to the Grazing Service lists describing such withdrawn lands as it desires to have administered by the Grazing Service pursuant to the terms of this understanding; and the Grazing Service will notify the Bureau of Reclamation as to which of the lands so listed it will administer pursuant to the terms of this understanding, including in such notice the date when it will assume administrative control over said lands.

6. Such lands as, pursuant to paragraph 5 hereof, the Grazing Service administers for grazing purposes shall be administered by said Service in accordance with the Federal Range Code unless otherwise expressly provided herein. It is agreed (1) that the grazing fees for such lands shall not be less than that fixed for grazing-district lands

adjacent to such withdrawn lands and of similar value for grazing purposes; (2) that no refund of a grazing fee for any of such lands shall be made unless application therefor is made within 30 days after the expiration of the grazing period described in the license; (3) that the Grazing Service shall make every reasonable effort to obtain final disposition of such applications for refunds within five months from the receipt of any such application; (4) that subject to"(2)" above, refunds of grazing fees for any of such lands, which may be made by the Grazing Service, shall be deducted from the grazing fees collected for the lands before payment is made to the Bureau of Reclamation as provided in paragraph 8 hereof.

7. On all licenses and permits issued by the Grazing Service involving lands covered in this memorandum, there shall be noted in conspicuous type the following: "See stipulations attached hereto and made a part hereof." The attachment will set forth in clear and concise language any provisions which are required to conform to the terms of this memorandum and which are not in accord with the Federal Range Code.

8. The Grazing Service shall pay to the Bureau of Reclamation for disposal under the applicable Federal Reclamation Laws the grazing fees collected in connection with the lands placed under the administration of the Grazing Service pursuant to this agreement, less such refunds of such fees as may be made in accordance with the provisions of paragraph 6 of this memorandum. The amount of grazing fees for such lands shall be computed on the basis of actual use thereof at the same rate of charge as for adjacent grazing-district lands except that, in special cases where the reclamation withdrawn lands have a higher grazing value or for some other reason are of greater value than the grazing-district lands, a higher rate of fees may be set. Said payments shall be made to the Bureau of Reclamation by the Grazing Service annually upon a calendar year basis. The accounting for such payments shall be in such manner, agreed upon by the Grazing Service and the Bureau of Reclamation, as will meet the accounting requirements of both.

9. Any lands placed under the administration of the Grazing Service pursuant to this understanding, including lands covered by outstanding licenses or permits, may be withdrawn therefrom by the Bureau of Reclamation upon the giving of twelve months' notice in writing to the Grazing Service.

H. W. Bashore

Acting Commissioner, Bureau of Reclamation

Julian Terrett

Acting Director of Grazing

Approved: April 29, 1941
E. K. Burlew
First Assistant Secretary

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

RIO GRANDE PROJECT, NEW MEXICO-TEXAS

LANDS TO BE ADMINISTERED BY GRAZING SERVICE

CABALLO RESERVOIR SITE

Acquired Lands

Township 14 South, Range 4 West, New Mexico Principal Meridian

Sec. 7 - $E\frac{1}{2}$, Less Lot 5
$E\frac{1}{2}W\frac{1}{2}$
$W\frac{1}{2}NW\frac{1}{4}$ East of Highway
$NW\frac{1}{4}SW\frac{1}{4}$ East of Highway
Sec. 8 - $W\frac{1}{2}$ $SW\frac{1}{4}$
Sec. 17 - $W\frac{1}{2}E\frac{1}{2}$, $W\frac{1}{2}$
Sec. 18 - $E\frac{1}{2}$, $E\frac{1}{2}W\frac{1}{2}$
$W\frac{1}{2}NW\frac{1}{4}$ East of Highway
$NW\frac{1}{4}SW\frac{1}{4}$ East of Highway
Sec. 19 - $E\frac{1}{2}$, $E\frac{1}{2}NW\frac{1}{4}$, $NE\frac{1}{4}SW\frac{1}{4}$
$SE\frac{1}{4}SW\frac{1}{4}$ East of Highway
Sec. 20 - $W\frac{1}{2}E\frac{1}{2}$, $E\frac{1}{2}SW\frac{1}{4}$, $SW\frac{1}{4}SW\frac{1}{4}$
Sec. 29 - $W\frac{1}{2}E\frac{1}{2}$, $W\frac{1}{2}$
Sec. 30 - $N\frac{1}{2}NE\frac{1}{4}$, East 940' of $NE\frac{1}{4}NW\frac{1}{4}$
Sec. 31 - $E\frac{1}{2}NE\frac{1}{4}$, $NW\frac{1}{4}NE\frac{1}{4}$, $SE\frac{1}{4}$
Sec. 32 - $NW\frac{1}{4}NE\frac{1}{4}$, $NE\frac{1}{4}NW\frac{1}{4}$, $W\frac{1}{2}W\frac{1}{2}$

Township 15 South, Range 4 West, New Mexico Principal Meridian

Sec. 5 - $W\frac{1}{2}NE\frac{1}{4}$, $W\frac{1}{2}$, $SE\frac{1}{4}$
Sec. 6 - $E\frac{1}{2}$, $SE\frac{1}{4}NW\frac{1}{4}$, $E\frac{1}{2}SW\frac{1}{4}$
Sec. 7 All
Sec. 8 - All
Sec. 17 - $W\frac{1}{2}NE\frac{1}{4}$, $NE\frac{1}{4}NW\frac{1}{4}$, $W\frac{1}{2}W\frac{1}{2}$, $NE\frac{1}{4}SW\frac{1}{4}$, $NW\frac{1}{4}SE\frac{1}{4}$
Sec. 18 - All
Sec. 19 - $E\frac{1}{2}$, $NW\frac{1}{4}$, $E\frac{1}{2}SW\frac{1}{4}$, $SW\frac{1}{4}SW\frac{1}{4}$
Sec. 20 - $W\frac{1}{2}NW\frac{1}{4}$, $SE\frac{1}{4}NW\frac{1}{4}$, $SW\frac{1}{4}$
Sec. 29 - $W\frac{1}{2}NW\frac{1}{4}$, $SE\frac{1}{4}NW\frac{1}{4}$, $NW\frac{1}{4}SW\frac{1}{4}$
Sec. 30 - All
Sec. 31 - $W\frac{1}{2}E\frac{1}{2}$, $W\frac{1}{2}$

Township 16 South, Range 4 West, New Mexico Principal Meridian

Sec. 6 - $NW\frac{1}{4}NE\frac{1}{4}$ or lots 2 and 7
$W\frac{1}{2}$, $SW\frac{1}{4}SE\frac{1}{4}$
Sec. 7 - $W\frac{1}{2}NE\frac{1}{4}$, $W\frac{1}{2}$, $NW\frac{1}{4}SE\frac{1}{4}$
Sec. 18 - $W\frac{1}{2}W\frac{1}{2}$, $SE\frac{1}{4}SE\frac{1}{4}SW\frac{1}{4}$, $S\frac{1}{2}SW\frac{1}{4}SE\frac{1}{4}$
Sec. 19 - $N\frac{1}{2}NW\frac{1}{4}NE\frac{1}{4}$, $NW\frac{1}{4}$, $NW\frac{1}{4}SE\frac{1}{4}$
Sec. 30 - That part of $E\frac{1}{2}NW\frac{1}{4}$ and $NE\frac{1}{4}SW\frac{1}{4}$ lying east of west bank of river

CABALLO RESERVOIR SITE

## Acquired Lands

**Township 15 South, Range 5 West, New Mexico Principal Meridian**

Sec. 12 - $SE\frac{1}{4}SE\frac{1}{4}$
Sec. 13 - $NE\frac{1}{4}NE\frac{1}{4}$
Sec. 25 - $SE\frac{1}{4}NE\frac{1}{4}$,
$SW\frac{1}{4}NE\frac{1}{4}$ East of Highway
$E\frac{1}{2}SW\frac{1}{4}$ East of Highway
$SE\frac{1}{4}$
Sec. 36 - $SE\frac{1}{4}NE\frac{1}{4}$

Township 16 South, Range 5 West, New Mexico Principal Meridian

Sec. 1 - $E\frac{1}{2}E\frac{1}{2}$, $SE\frac{1}{4}SW\frac{1}{4}$, $SW\frac{1}{4}SE\frac{1}{4}$
Sec. 12 - $E\frac{1}{2}$, $N\frac{1}{2}NW\frac{1}{4}$
Sec. 13 - $E\frac{1}{2}$, $NW\frac{1}{4}$
Sec. 23 - $E\frac{1}{2}SW\frac{1}{4}$, $N\frac{1}{2}SE\frac{1}{4}$, $SE\frac{1}{4}SE\frac{1}{4}$
Sec. 24 - $E\frac{1}{2}NE\frac{1}{4}$, $NW\frac{1}{4}NE\frac{1}{4}$, $SW\frac{1}{4}SW\frac{1}{4}$
Sec. 25 - $N\frac{1}{2}NW\frac{1}{4}$, $SW\frac{1}{4}NW\frac{1}{4}$, $W\frac{1}{2}SW\frac{1}{4}$
Sec. 26 - $E\frac{1}{2}NE\frac{1}{4}$

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## Public Withdrawn Lands

**Township 14 South, Range 4 West, New Mexico Principal Meridian**

Sec. 4- $SW\frac{1}{4}SW\frac{1}{4}$ (Lot 12)
Sec. 5 - Lots 5 and 6 (part $S\frac{1}{2}SE\frac{1}{4}$)
Sec. 7 - $SW\frac{1}{4}SW\frac{1}{4}$
Lot 5 (in $SW\frac{1}{4}SE\frac{1}{4}$)
Sec. 8 - $N\frac{1}{2}N\frac{1}{2}$, $E\frac{1}{2}SW\frac{1}{4}$
Sec. 17 - $E\frac{1}{2}E\frac{1}{2}$
Sec. 18 - $SW\frac{1}{4}SW\frac{1}{4}$
Sec. 19 - $W\frac{1}{2}W\frac{1}{2}$
Sec. 20 - $E\frac{1}{2}E\frac{1}{2}$, $NW\frac{1}{4}$, $NW\frac{1}{4}SW\frac{1}{4}$
Sec. 29 - $E\frac{1}{2}E\frac{1}{2}$
Sec. 30 - $NW\frac{1}{4}NW\frac{1}{4}$
Sec. 31 - $SW\frac{1}{4}NE\frac{1}{4}$
Sec. 32 - $NE\frac{1}{4}NE\frac{1}{4}$, $S\frac{1}{2}NE\frac{1}{4}$, $SE\frac{1}{4}NW\frac{1}{4}$, $E\frac{1}{2}SW\frac{1}{4}$, $SE\frac{1}{4}$

**Township 15 South, Range 4 West, New Mexico Principal Meridian**

Sec. 4 - $SW\frac{1}{4}$
Sec. 5 - $E\frac{1}{2}NE\frac{1}{4}$
Sec. 6 - $NE\frac{1}{4}NW\frac{1}{4}$, $W\frac{1}{2}W\frac{1}{2}$
Sec. 9 - $NW\frac{1}{4}$
Sec. 17 - $E\frac{1}{2}E\frac{1}{2}$, $SE\frac{1}{4}NW\frac{1}{4}$, $SE\frac{1}{4}SW\frac{1}{4}$, $SW\frac{1}{4}SE\frac{1}{4}$
Sec. 19 - $NW\frac{1}{4}SW\frac{1}{4}$

CABALLO RESERVOIR SITE

Public Withdrawn Lands

**Township 15 South, Range 4 West, New Mexico Principal Meridian (Continued)**

Sec. 20 - $NE\frac{1}{4}$, $NE\frac{1}{4}NW\frac{1}{4}$
Sec. 29 - $NE\frac{1}{4}NW\frac{1}{4}$, $SW\frac{1}{4}SW\frac{1}{4}$, $E\frac{1}{2}SW\frac{1}{4}$
Sec. 31 - $E\frac{1}{2}E\frac{1}{2}$

Township 16 South, Range 4 West, New Mexico Principal Meridian

Sec. 6 - $E\frac{1}{2}E\frac{1}{2}$, $SW\frac{1}{4}NE\frac{1}{4}$, $NW\frac{1}{4}SE\frac{1}{4}$
Sec. 7 - $E\frac{1}{2}E\frac{1}{2}$, $SW\frac{1}{4}SE\frac{1}{4}$
Sec. 18 - $NE\frac{1}{4}$, $E\frac{1}{2}NW\frac{1}{4}$, $NE\frac{1}{4}SW\frac{1}{4}$, $W\frac{1}{2}SE\frac{1}{4}SW\frac{1}{4}$, $NE\frac{1}{4}SE\frac{1}{4}SW\frac{1}{4}$
$N\frac{1}{2}SE\frac{1}{4}$, $N\frac{1}{2}S\frac{1}{2}SE\frac{1}{4}$
Sec. 19 - $S\frac{1}{2}NE\frac{1}{4}$, $S\frac{1}{2}N\frac{1}{2}NE\frac{1}{4}$
$NE\frac{1}{4}SE\frac{1}{4}$, $S\frac{1}{2}SE\frac{1}{4}$
Sec. 20 - $S\frac{1}{2}S\frac{1}{2}N\frac{1}{2}SW\frac{1}{4}$, $S\frac{1}{2}N\frac{1}{2}S\frac{1}{2}N\frac{1}{2}SW\frac{1}{4}$
$S\frac{1}{2}S\frac{1}{2}$
$SW\frac{1}{4}NE\frac{1}{4}SE\frac{1}{4}$, $NW\frac{1}{4}SE\frac{1}{4}$
Sec. 21 - $SW\frac{1}{4}SW\frac{1}{4}$
Sec. 30 - $NE\frac{1}{4}$, $SE\frac{1}{4}SW\frac{1}{4}$

**Township 15 South, Range 5 West, New Mexico Principal Meridian**

Sec. 12 - $NE\frac{1}{4}SE\frac{1}{4}$, $W\frac{1}{2}SE\frac{1}{4}$
Sec. 13 - $SE\frac{1}{4}NE\frac{1}{4}$, $E\frac{1}{2}SE\frac{1}{4}$, $W\frac{1}{2}E\frac{1}{2}$
Sec. 25 - $N\frac{1}{2}NE\frac{1}{4}$, $W\frac{1}{2}SW\frac{1}{4}$
Sec. 36 - $N\frac{1}{2}NE\frac{1}{4}$, $SW\frac{1}{4}NE\frac{1}{4}$, $W\frac{1}{2}$, $SE\frac{1}{4}$

Township 16 South, Range 5 West, New Mexico Principal Meridian

Sec. 1 - $W\frac{1}{2}NE\frac{1}{4}$, $S\frac{1}{2}NW\frac{1}{4}$
$N\frac{1}{2}SW\frac{1}{4}$, $SW\frac{1}{4}SW\frac{1}{4}$
$NW\frac{1}{4}SE\frac{1}{4}$
Sec. 12 - $S\frac{1}{2}NW\frac{1}{4}$, $SW\frac{1}{4}$
Sec. 13 - $SW\frac{1}{4}$
Sec. 23 - $SW\frac{1}{4}SE\frac{1}{4}$
Sec. 24 - $E\frac{1}{2}NW\frac{1}{4}$, $SW\frac{1}{4}NE\frac{1}{4}$, $NW\frac{1}{4}SW\frac{1}{4}$
Sec. 25 - $NE\frac{1}{4}$
Sec. 26 - $W\frac{1}{2}NE\frac{1}{4}$

DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
RIO GRANDE IRRIGATION PROJECT
NEW MEXICO - TEXAS

# SUPPLEMENTAL MEMORANDUM OF UNDERSTANDING

Approved October 5, 1942

Between

GRAZING SERVICE

and

BUREAU OF RECLAMATION

Administration of Grazing Privileges on
Caballo Reservoir Lands

COPY

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
Washington

Sept. 18, 1942

The Secretary

of the Interior.
(Through the Director of the Grazing Service)

Sir:

In accordance with the Memorandum of Understanding between the Bureau of Reclamation and the Grazing Service, approved by the Department on April 29, 1941, the Superintendent in charge of the Rio Grande project, New Mexico-Texas, and the Regional Grazier for New Mexico, have entered into the enclosed agreement, subject to your approval, whereby the Grazing Service will assume the grazing administration of certain withdrawn public lands and lands purchased in connection with the Caballo reservoir site, Rio Grande Project.

The Memorandum of Understanding approved April 29, 1941, is applicable only to reclamation withdrawn lands. The enclosed Supplemental Memorandum of Understanding has therefore been prepared for the purpose of transferring the grazing administration of both withdrawn and acquired lands in the vicinity of Caballo reservoir to the Grazing Service.

It is believed better administration in connection with adjoining areas of public lands can be effected if the Grazing Service has supervision of the lands proposed for transfer. It is therefore recommended that the enclosed Supplemental Memorandum of Understanding be approved.

Respectfully,

/s/ John C. Page

Commissioner

Enclosure 47

I concur:
/s/ JULIAN TERRETT

Acting Director, Grazing Service.
Oct. 5, 1942

Enclosure approved by
/s/ OSCAR L. CHAPMAN

Assistant Secretary
of the Interior

Copy for CP (w/c of agreement)
Gen. Supt., Colo. (w/c of agreement)
DC, Amarillo, Texas (w/c of agreement)
Supt., El Paso, Texas (w/c of agreement)

Copy to Grazing Service

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

RIO GRANDE PROJECT

SUPPLEMENTAL MEMORANDUM OF UNDERSTANDING

THIS SUPPLEMENTAL MEMORANDUM OF UNDERSTANDING, Made and entered into this_____day of_____, by and between the Bureau of Reclamation, Department of the Interior, hereinafter referred to as the Bureau, represented by the officer executing this Memorandum, and the Grazing Service, Department of the Interior, hereinafter referred to as the Service, represented by the officer executing this Memorandum;

WITNESSETH:

1. WHEREAS, the Bureau and the Service have heretofore entered into a Memorandum of Understanding approved by the First Assistant Secretary of the Interior on April 29, 1941, providing for cooperation in the administration of lands withdrawn for Reclamation purposes, a copy of which Memorandum of Understanding is attached hereto; and

2. WHEREAS, portions of grazing lands withdrawn under the first form of withdrawal and private lands acquired by purchase for the Caballo Reservoir, Rio Grande project, are adjacent to, or within the boundaries of grazing districts Nos. 3 and 4 and can be conveniently administered by the Service; and

3. WHEREAS, pursuant to paragraph 5 of the said Memorandum of Understanding of April 29, 1941, the Service and the Bureau are to agree on lists of lands now under the administration of the Bureau which are to be administered by the Service; and

4. WHEREAS, pursuant to paragraph 7 of said Memorandum of Understanding of April 29, 1941, the Bureau is to supply necessary stipulations to be attached to permits or licenses affecting said withdrawn and acquired lands.

NOW, THEREFORE, the parties hereto agree as follows:

5. The Service will administer the lands described in the list attached hereto in accordance with the said Memorandum of Understanding of April 29, 1941, and in accordance with the stipulations contained in this supplemental Memorandum of Understanding: Provided, That in case of conflict between the provisions of said Memoranda, the provisions of this supplemental Memorandum shall control.

6. In addition to the stipulations which, pursuant to article 7 of the Memorandum of Understanding of April 29, 1941, are to be attached to licenses and permits issued by the Service, the following stipulations shall be attached to licenses and permits involving lands covered by this supplemental Memorandum of Understanding:

(1) There is reserved in the Bureau of Reclamation the exclusive right to lease recreational and commercial concessions on any and all of said lands described in the attached list, including building sites thereon, and it is understood that when any such tract or tracts of lands for use of concessionaires or for building site purposes, is so designated

by the Superintendent of the Bureau, the same shall immediately upon notice thereof be excepted from the attached list of lands agreed to be administered by the Service. Concessionaires to whom leases or permits may be granted by the Bureau shall be allowed reasonable access over and across lands covered by this agreement to and from locations covered by such concession leases or permits.

(2) There is reserved in the Bureau of Reclamation the exclusive right of administration of the reservoir behind the Caballo Dam for conservation of the project water supply, flood protection, and the protection of structures of the Bureau, and no license or permit shall have any right in or [illegible] void [illegible] be filled except as [illegible] purposes in connection with the exercise of grazing privileges.

(3) Any license or permit by the Service affecting lands described in the attached list, which said lands border upon or may be adjacent to the reservoir flow line, shall be subject to the rights of the Bureau to [illegible] and maintain any and all of the structures [illegible] Grande project, and any licensee or permittee [illegible] such license or permit, agrees to save and hold the United

States harmless as to any damages occasioned by the operation or maintenance of any of the Bureau structures and as to any damage to or loss of livestock caused by reason of the seeped or boggy condition of lands under said license or permit.

7. The operation of this agreement shall not prevent or prohibit hunting and fishing on the reservoir or the lands described in the attached list which are marginal to the reservoir in accordance with applicable federal and state laws and regulations.

8. Fees to be charged by the Grazing Service for grazing privileges on reclamation withdrawn lands will be identical with the fees charged by the Grazing Service for grazing permits on adjoining areas until such time as it is demonstrated that the operation of the reservoir creates unusually good grazing conditions, or extremely poor grazing conditions, at which time, upon notification from the Bureau of the amounts considered a fair charge, other arrangements will be made as to the fee to be collected.

GRAZING SERVICE

by Ed Pierson
Regional Grazier

BUREAU OF RECLAMATION

by L. R. Fiock
Superintendent
Rio Grande Project

(Seal)

Approved: Oct. 5, 1948
Date

H. K. Burlew
First Assistant Secretary

MEMORANDUM OF UNDERSTANDING FOR COOPERATION BETWEEN THE BUREAU OF RECLAMATION AND THE GRAZING SERVICE, DEPARTMENT OF THE INTERIOR, FOR RANGE ADMINISTRATION OF LANDS WITHDRAWN FOR RECLAMATION PURPOSES.

Pursuant to the act of June 17, 1902 (32 Stat. 388), and acts amendatory thereof or supplementary thereto (hereinafter referred to as the Federal Reclamation Laws) and to section 12 of the Taylor Grazing Act of June 28, 1934 (48 Stat. 1269), as amended, it is hereby agreed and understood between the Bureau of Reclamation and the Grazing Service, Department of the Interior, as follows:

1. Whereas many of the lands withdrawn for reclamation purposes under the Federal Reclamation Laws, prior to the time when they are needed in connection with the construction or operation and maintenance of a reclamation project, can best be utilized for the grazing of livestock; and

2. Whereas many of such withdrawn lands are or may be located within the exterior boundaries of grazing districts established under the Taylor Grazing Act of June 28, 1934 (48 Stat. 1269), as amended, without being a part of a grazing district, the Secretary of the Interior not having approved the inclusion of them in a district; and

3. Whereas range administration of such withdrawn lands can best be effected by the Grazing Service, particularly since the same stock grazes part time on grazing-district lands and part time on such withdrawn lands; and

4. Whereas the grazing fees fixed by the Secretary of the Interior for the use of grazing-district lands adjacent to such withdrawal and of similar value for grazing purposes are adequate to provide a reasonable return to the Reclamation fund for the use of most of such withdrawn lands.

5. The Bureau of Reclamation will, from time to time, submit to the Grazing Service lists describing such withdrawn lands as it desires to have administered by the Grazing Service pursuant to the terms of this understanding; and the Grazing Service will notify the Bureau of Reclamation as to which of the lands so listed it will administer pursuant to the terms of this understanding, including in such notice the date when it will assume administrative control over said lands.

6. Such lands as, pursuant to paragraph 5 hereof, the Grazing Service administers for grazing purposes shall be administered by said Service in accordance with the Federal Range Code unless otherwise expressly provided herein. It is agreed (1) that the grazing fees for such lands shall not be less than that fixed for grazing-district lands

CONT'D

adjacent to such withdrawn lands and of similar value for grazing purposes; (2) that no refund of a grazing fee for any of such lands shall be made unless application therefor is made within 30 days after the expiration of the grazing period described in the license; (3) that the Grazing Service shall make every reasonable effort to obtain final disposition of such applications for refunds within five months from the receipt of any such application; (4) that subject to "(2)" above, refunds of grazing fees for any of such lands, which may be made by the Grazing Service, shall be deducted from the grazing fees collected for the lands before payment is made to the Bureau of Reclamation as provided in paragraph 8 hereof.

7. On all licenses and permits issued by the Grazing Service involving lands covered in this memorandum, there shall be noted in conspicuous type the following: "See stipulations attached hereto and made a part hereof." The attachment will set forth in clear and concise language any provisions which are required to conform to the terms of this memorandum and which are not in accord with the Federal Range Code.

8. The Grazing Service shall pay to the Bureau of Reclamation for disposal under the applicable Federal Reclamation Laws the [illegible] collected in connection with the lands placed under the [illegible] the Grazing Service pursuant to this agreement, [illegible] fees as may be made in accordance with the [illegible] this memorandum. The amount of grazing [illegible] puted on the basis of actual use [illegible] adjacent grazing-district lands [illegible] reclamation withdrawn lands have a higher [illegible] reason are of greater value than the grazing-district lands, a higher rate of fees may be set. Said payments shall be made to the Bureau of Reclamation by the Grazing Service annually upon a calendar year basis. The accounting for such payments shall be in such manner, agreed upon by the Grazing Service and the Bureau of Reclamation, as will meet the accounting requirements of both.

9. Any lands placed under the administration of the Grazing Service pursuant to this understanding, including lands covered by [illegible] licenses or permits, may be withdrawn therefrom by the Bureau of Reclamation upon the giving of twelve months' notice in writing to the Grazing Service.

H. H. [illegible]

Acting Commissioner, [illegible]

Julian [illegible]

Approved: April 29, 1941
E. K. Burlew
First Assistant Secretary

Acting Director of Grazing

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

RIO GRANDE PROJECT, NEW MEXICO-TEXAS

LANDS TO BE ADMINISTERED BY GRAZING SERVICE

CABALLO RESERVOIR SITE

Acquired Lands

Township 14 South, Range 4 West, New Mexico Principal Meridian

Sec. 7 - $E\frac{1}{2}$, Less Lot 5
$E\frac{1}{2}W\frac{1}{2}$
$W\frac{1}{2}NW\frac{1}{4}$ East of Highway
$NE\frac{1}{4}SW\frac{1}{4}$ East of Highway
Sec. 8 - $W\frac{1}{2}$ $SW\frac{1}{4}$
Sec. 17 - $W\frac{1}{2}E\frac{1}{2}$, $W\frac{1}{2}$
Sec. 18 - $E\frac{1}{2}$, $E\frac{1}{2}W\frac{1}{2}$
$W\frac{1}{2}NW\frac{1}{4}$ East of Highway
$NW\frac{1}{4}SW\frac{1}{4}$ East of Highway
Sec. 19 - $E\frac{1}{2}$, $E\frac{1}{2}NW\frac{1}{4}$, $NE\frac{1}{4}SW\frac{1}{4}$
$SE\frac{1}{4}SW\frac{1}{4}$ East of Highway
Sec. 20 - $W\frac{1}{2}E\frac{1}{2}$, $E\frac{1}{2}SW\frac{1}{4}$, $SW\frac{1}{4}SW\frac{1}{4}$
Sec. 29 - $W\frac{1}{2}E\frac{1}{2}$, $W\frac{1}{2}$
Sec. 30 - $E\frac{1}{2}NE\frac{1}{4}$, East 940' of $NE\frac{1}{4}NW\frac{1}{4}$
Sec. 31 - $E\frac{1}{2}NE\frac{1}{4}$, $NE\frac{1}{4}SE\frac{1}{4}$, $SE\frac{1}{4}$
Sec. 32 - $NE\frac{1}{4}NE\frac{1}{4}$, $NE\frac{1}{4}SE\frac{1}{4}$, $W\frac{1}{2}W\frac{1}{2}$

Township 15 South, Range 4 West, New Mexico Principal Meridian

Sec. 5 - $W\frac{1}{2}NE\frac{1}{4}$, $W\frac{1}{2}$, $SE\frac{1}{4}$
Sec. 6 - $E\frac{1}{2}$, $SE\frac{1}{4}NW\frac{1}{4}$, $E\frac{1}{2}SW\frac{1}{4}$
Sec. 7 - All
Sec. 8 - All
Sec. 17 - $W\frac{1}{2}NE\frac{1}{4}$, $NE\frac{1}{4}NW\frac{1}{4}$, $W\frac{1}{2}W\frac{1}{2}$, $NE\frac{1}{4}SW\frac{1}{4}$, $N\frac{1}{2}SE\frac{1}{4}$
Sec. 18 - All
Sec. 19 - $E\frac{1}{2}$, $NW\frac{1}{4}$, $E\frac{1}{2}SW\frac{1}{4}$, $SW\frac{1}{4}SW\frac{1}{4}$
Sec. 20 - $W\frac{1}{2}NW\frac{1}{4}$, $SE\frac{1}{4}NW\frac{1}{4}$, $SW\frac{1}{4}$
Sec. 29 - $W\frac{1}{2}NW\frac{1}{4}$, $SE\frac{1}{4}NW\frac{1}{4}$, $NW\frac{1}{4}SW\frac{1}{4}$
Sec. 30 - All
Sec. 31 - $W\frac{1}{2}E\frac{1}{2}$, $W\frac{1}{2}$

Township 16 South, Range 4 West, New Mexico Principal Meridian

Sec. 6 - $NW\frac{1}{4}NE\frac{1}{4}$ or lots 2 and 7
$W\frac{1}{2}$, $SW\frac{1}{4}SE\frac{1}{4}$
Sec. 7 - $W\frac{1}{2}NE\frac{1}{4}$, $W\frac{1}{2}$, $NW\frac{1}{4}SE\frac{1}{4}$
Sec. 18 - $W\frac{1}{2}W\frac{1}{2}$, $SE\frac{1}{4}SE\frac{1}{4}SW\frac{1}{4}$, $S\frac{1}{2}SW\frac{1}{4}SE\frac{1}{4}$
Sec. 19 - $N\frac{1}{2}NW\frac{1}{4}NE\frac{1}{4}$, $NW\frac{1}{4}$, $NE\frac{1}{4}SE\frac{1}{4}$
Sec. 20 - That part of $E\frac{1}{2}NW\frac{1}{4}$ and [illegible] lying east of
west bank of river

CABALLO RESERVOIR SITE

## Acquired Lands

Township 15 South, Range 5 West, New Mexico Principal Meridian

Sec. 12 - $SE\frac{1}{4}SE\frac{1}{4}$
Sec. 13 - $NE\frac{1}{4}NE\frac{1}{4}$
Sec. 25 - $SE\frac{1}{4}NE\frac{1}{4}$,
$SW\frac{1}{4}NE\frac{1}{4}$ East of Highway
$E\frac{1}{2}SW\frac{1}{4}$ East of Highway
$SE\frac{1}{4}$
Sec. 36 - $SE\frac{1}{4}NE\frac{1}{4}$

Township 16 South, Range 5 West, New Mexico Principal Meridian

Sec. 1 - $E\frac{1}{2}E\frac{1}{2}$, $SE\frac{1}{4}SW\frac{1}{4}$, $SW\frac{1}{4}SE\frac{1}{4}$
Sec. 12 - $E\frac{1}{2}$, $N\frac{1}{2}NW\frac{1}{4}$
Sec. 13 - $E\frac{1}{2}$, $NW\frac{1}{4}$
Sec. 23 - $E\frac{1}{2}SW\frac{1}{4}$, $W\frac{1}{2}SE\frac{1}{4}$, $SE\frac{1}{4}SE\frac{1}{4}$
Sec. 24 - $E\frac{1}{2}NE\frac{1}{4}$, $NW\frac{1}{4}NE\frac{1}{4}$, $SW\frac{1}{4}SW\frac{1}{4}$
Sec. 25 - $W\frac{1}{2}NW\frac{1}{4}$, $SW\frac{1}{4}NW\frac{1}{4}$, $W\frac{1}{2}SW\frac{1}{4}$
Sec. 26 - $E\frac{1}{2}NE\frac{1}{4}$

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## Public Withdrawn Lands

Township 14 South, Range 4 West, New Mexico Principal Meridian

Sec. 4 - $SW\frac{1}{4}SW\frac{1}{4}$ (Lot 12)
Sec. 5 - Lots 5 and 6 (part $S\frac{1}{2}SE\frac{1}{4}$)
Sec. 7 - $SW\frac{1}{4}SW\frac{1}{4}$
Lot 5 (in $SW\frac{1}{4}SE\frac{1}{4}$)
Sec. 8 - $N\frac{1}{2}N\frac{1}{2}$, $E\frac{1}{2}NW\frac{1}{4}$
Sec. 17 - $E\frac{1}{2}E\frac{1}{2}$
Sec. 18 - $SW\frac{1}{4}SE\frac{1}{4}$
Sec. 19 - $W\frac{1}{2}W\frac{1}{2}$
Sec. 20 - $E\frac{1}{2}E\frac{1}{2}$, $NW\frac{1}{4}$, $NE\frac{1}{4}SW\frac{1}{4}$
Sec. 29 - $E\frac{1}{2}E\frac{1}{2}$
Sec. 30 - $NW\frac{1}{4}NW\frac{1}{4}$
Sec. 31 - $SW\frac{1}{4}NE\frac{1}{4}$
Sec. 32 - $NE\frac{1}{4}NE\frac{1}{4}$, $S\frac{1}{2}NE\frac{1}{4}$, $SE\frac{1}{4}NW\frac{1}{4}$, $E\frac{1}{2}SW\frac{1}{4}$, $SE\frac{1}{4}$

Township 15 South, Range 4 West, New Mexico Principal Meridian

Sec. 4 - $SW\frac{1}{4}$
Sec. 5 - $E\frac{1}{2}NE\frac{1}{4}$
Sec. 6 - $NE\frac{1}{4}NW\frac{1}{4}$, $W\frac{1}{2}W\frac{1}{2}$
Sec. 9 - $NW\frac{1}{4}$
Sec. 17 - $E\frac{1}{2}E\frac{1}{2}$, $SE\frac{1}{4}NW\frac{1}{4}$, $SE\frac{1}{4}SW\frac{1}{4}$, $SW\frac{1}{4}SE\frac{1}{4}$
Sec. 19 - $NE\frac{1}{4}NE\frac{1}{4}$

## CABALLO RESERVOIR SITE

### Public Withdrawn Lands

**Township 15 South, Range 4 West, New Mexico Principal Meridian (Continued)**

Sec. 20 - NE¼, NE¼NW¼
Sec. 29 - NE¼NW¼, SW¼SW¼, E½SW¼
Sec. 31 - E½E½

Township 16 South, Range 4 West, New Mexico Principal Meridian

Sec. 6 - E½E½, SW¼NE¼, NW¼SE¼
Sec. 7 - E½E½, SW¼SE¼
Sec. 18 - NE¼, E½NW¼, NE¼SW¼, W½SW¼SW¼, NE¼SE¼SW¼
E½SE¼, N½SW¼SE¼
Sec. 19 - S½NE¼, S½N½NE¼
NE¼SE¼, S½SE¼
Sec. 20 - S½S½N½SW¼, S½N½S½N½SW¼
S½SW¼
SW¼NW¼SE¼, W½SE¼
Sec. 21 - SW¼SW¼
Sec. 30 - NE¼, SE¼SW¼

**Township 15 South, Range 5 West, New Mexico Principal Meridian**

Sec. 12 - NE¼SE¼, W½NE¼
Sec. 13 - SE¼NE¼, E½SE¼, W½NE¼
Sec. 25 - N½NE¼, W½SW¼
Sec. 36 - N½NE¼, SW¼NE¼, W½, SE¼

Township 16 South, Range 5 West, New Mexico Principal Meridian

Sec. 1 - W½NE¼, S½NW¼
N½SW¼, SW¼SW¼
NW¼SE¼
Sec. 12 - S½NW¼, SW¼
Sec. 13 - SW¼
Sec. 23 - SW¼SE¼
Sec. 24 - E½NW¼, SW¼NE¼, NW¼SW¼
Sec. 25 - NE¼
Sec. 36 - W½NE¼

SUPPLEMENTAL MEMORANDUM OF UNDERSTANDING

Dated June 1, 1948

Approved May 6, 1949

Between

BUREAU OF LAND MANAGEMENT

and

BUREAU OF RECLAMATION

**Administration of Grazing Privileges on Elephant Butte Reservoir Lands**

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

RIO GRANDE PROJECT

SUPPLEMENTAL MEMORANDUM OF UNDERSTANDING

THIS SUPPLEMENTAL MEMORANDUM OF UNDERSTANDING, Made and entered into this 1st day of June 1948, by and between the Bureau of Reclamation, Department of the Interior, represented by the officer executing this Memorandum, and the Grazing Service, now Bureau of Land Management, Department of the Interior, represented by the officer executing this Memorandum;

WITNESSETH:

1. WHEREAS, the Bureau of Reclamation and the Grazing Service have heretofore entered into a Memorandum of Understanding approved by the First Assistant Secretary of the Interior on April 29, 1941, providing for cooperation in the administration of lands withdrawn for [illegible] purposes, a copy of which Memorandum of Understanding is attached hereto; and

2. WHEREAS, portions of grazing lands withdrawn under the first form of withdrawal and private lands acquired by purchase for the Elephant Butte Reservoir, Rio Grande Project, are adjacent to, or within the boundaries of grazing districts Nos. 2, 3 and 4 and can be conveniently administered by the Bureau of Land Management; and

3. WHEREAS, pursuant to paragraph 5 of the said Memorandum of Understanding of April 29, 1941, the Bureau of Land Management and the Bureau of Reclamation are to agree on lists of lands now under the administration of the Bureau of Reclamation which are to be administered by the Bureau of Land Management; and

4. WHEREAS, pursuant to paragraph 7 of said Memorandum of Understanding of April 29, 1941, the Bureau of Reclamation is to supply necessary stipulations to be attached to permits or licenses affecting said withdrawn and acquired lands.

NOW, THEREFORE, the parties hereto agree as follows:

5. The Bureau of Land Management will administer the lands described in the list attached hereto in accordance with the said Memorandum of Understanding of April 29, 1941, and in accordance with the stipulations contained in this Supplemental Memorandum of Understanding: Provided, That in case of conflict between the provisions of said Memoranda, the provisions of this Supplemental Memorandum shall control.

6. In addition to the stipulations which, pursuant to article 7 of the Memorandum of Understanding of April 29, 1941, are to be attached to licenses and permits issued by the Bureau of Land Management, the following stipulations shall be attached to licenses and permits involving lands covered by this Supplemental Memorandum of Understanding:

(1) There is reserved in the Bureau of Reclamation the exclusive right to lease recreational and commercial concessions on any and all of said lands described in the attached list, including building sites thereon, and it is understood that when any such tract or tracts of lands for use of concessionaires or for building site purposes, is so designated by the Superintendent of the Bureau of

Reclamation, the same shall immediately upon notice thereof be excepted from the attached list of lands agreed to be administered by the Bureau of Land Management. Concessionaires to whom leases or permits may be granted by the Bureau of Reclamation shall be allowed reasonable access over and across lands covered by this agreement to and from locations covered by such concession leases or permits.

(2) There is reserved in the Bureau of Reclamation the exclusive right of administration of the reservoir behind the Elephant Butte Dam for conservation of the project water supply, flood protection, and the protection of structures of the Bureau of Reclamation and no licensee or permittee shall have any right in or upon the waters of said reservoir regardless of the height to which said reservoir may be filled except as same may be used for boat watering purposes in connection with the exercise of grazing privileges.

(3) Any license or permit issued by the Bureau of Land Management affecting lands described in the attached list, which said lands border upon or may be adjacent to the reservoir flow line, shall be subject to the rights of the Bureau of Reclamation to operate and maintain any and all of the structures of the Rio Grande project, and any licensee or permittee under any such license or permit, agrees to save and hold the United States harmless as to

any damages occasioned by the operation or maintenance of any of the Bureau of Reclamation's structures and as to any damage to or loss of livestock caused by reason of the seeped or boggy condition of lands under said license or permit.

7. The operation of this agreement shall not prevent or prohibit hunting and fishing on the reservoir or the lands described in the attached list which are marginal to the reservoir in accordance with applicable federal and state laws and regulations.

8. Fees to be charged by the Bureau of Land Management for grazing privileges on reclamation withdrawn lands will be identical with the fees charged by the Bureau of Land Management for grazing permits on adjoining areas until such time as it is demonstrated that the operation of the reservoir creates unusually good grazing conditions, or extremely poor grazing conditions, at which time, upon notification from the Bureau of Reclamation of the amounts considered a fair charge, other arrangements will be made as to the fee to be collected.

IN WITNESS WHEREOF, the parties have executed this Supplemental Memorandum of Understanding as of the date first hereinabove mentioned, subject to approval by the Secretary of the Interior.

BUREAU OF LAND MANAGEMENT

By /s/ E. R. Smith

BUREAU OF RECLAMATION

By /s/ L. R. Flock
Project Manager

(Seal)

Approved: May 6, 1949
Date

/s/ William [illegible]arne

# LIST OF LAND IN
# KLEPHART BUTTE RESERVOIR RESERVE
# TO ACCOMPANY MEMORANDUM OF UNDERSTANDING BETWEEN
# BUREAU OF RECLAMATION
# AND
# BUREAU OF LAND MANAGEMENT
# FOR
# ADMINISTRATION OF GRAZING PRIVILEGES

**Dated June 1, 1948**

| Township | Range | Section | Subdivision or fractions thereof |
|---|---|---|---|
| 8. S. | 2 W. | 20 | E½ E½ |
| | | 21 | W½ W½ |
| | | 29 | |
| | | 30 | NE¼ NE¼; S½ NE¼; SE¼; S½ SW¼ |
| | | 31 | |
| | | 32 | W½ |
| 9 S | 2 W. | 6 | |
| 9 S | 3 W. | 1 | E½; E½ SW¼; SW¼ SW¼ |
| | | 11 | SE¼ NE¼ E½ SW¼ |
| | | 12 | W½ NW¼ |
| | | 13 | |
| | | 14 | [illegible] |
| | | 23 | [illegible] |
| | | 24 | [illegible] |
| | | 25 | [illegible] |
| | | 26 | |
| | | 27 | SE¼ NE¼; SE¼ |
| | | 33 | S½ NE¼; SE¼ SE¼; SW¼ |
| | | 34 | |
| | | 35 | W½; NE¼ |
| 10 S | 3 W. | 3 | |
| | | 4 | |
| | | 5 | SW¼ NW¼; N½ SW¼ |
| | | 8 | E½ E½ |
| | | 9 | |
| | | 15 | W½ W½ |
| | | 16 | |
| | | 17 | [illegible] |
| | | 19 | [illegible] |
| | | 20 | [illegible] |
| | | 21 | [illegible] |
| | | 22 | [illegible] |
| | | 28 | W½ |
| | | 29 | |
| | | 30 | E½ E½; SW¼ SE¼ |
| | | 31 | NE¼ |
| | | 32 | N½; SE¼; E½ SW¼ |

| Township | Range | Section | Subdivision or Fractions thereof |
|---|---|---|---|
| | | 33 | NW¼; N½ SW¼; SW¼ SW¼ |
| 11 S. | 3 W | 4 | W½ W½ |
| | | 5 | [illegible] |
| | | 7 | [illegible] |
| | | 8 | [illegible] W½ SE¼ |
| | | 9 | W½ NW¼ |
| | | 17 | W½ E½; W½ |
| | | 18 | E½; SW¼; E½ NW¼ |
| | | 19 | |
| | | 20 | W½; W½ E½; E½ SE¼ |
| | | 21 | SW¼ |
| | | 28 | W½ |
| | | 29 | |
| | | 30 | |
| | | 31 | |
| | | 32 | |
| | | 33 | |
| | | 34 | W½ W½ |
| 11 S. | 4 W | 13 | [illegible] SE¼ |
| | | 24 | [illegible] SW¼ |
| | | 25 | [illegible] W½ |
| | | 35 | [illegible] |
| | | 36 | [illegible] W½; W½ NW¼ |
| 12 S. | 3 W | 3 | [illegible] |
| | | 4 | |
| | | 5 | |
| | | 6 | |
| 12 S. | 3 W | 7 | |
| | | 8 | |
| | | 9 | |
| | | 10 | W½ W½ |
| | | 15 | W½ NW¼ |
| | | 16 | W½ |
| | | 17 | W½ |
| | | 18 | W½ |
| 12 S. | 4 W | 1 | W½; NW¼ |
| | | 2 | NW¼; NW¼ |
| | | 12 | NW¼; NW¼ |

The above described land includes all of the public land now reserved under Reclamation Withdrawal for Elephant Butte Reservoir purposes and some of the land acquired from private owners for the same purpose, being that portion of the reservoir reserve bordering on Public Domain Land on which the Bureau of Land Management has issued or may issue grazing permits. The attached map shows in red that portion of the above described land which lies above the reservoir high water flow line at spillway crest elevation. The area below the high water flow line is subject to grazing where exposed or not inundated depending on the stage of the Reservoir or the elevation of the reservoir water surface.

MEMORANDUM OF UNDERSTANDING FOR COOPERATION BETWEEN THE BUREAU OF RECLAMATION AND THE GRAZING SERVICE, DEPARTMENT OF THE INTERIOR, FOR RANGE ADMINISTRATION OF LANDS WITHDRAWN FOR RECLAMATION PURPOSES.

Pursuant to the act of June 17, 1902 (32 Stat. 388), and acts amendatory thereof or supplementary thereto (hereinafter referred to as the Federal Reclamation Laws) and to section 12 of the Taylor Grazing Act of June 28, 1934 (48 Stat. 1269), as amended, it is hereby agreed and understood between the Bureau of Reclamation and the Grazing Service, Department of the Interior, as follows:

1. Whereas many of the lands withdrawn for reclamation purposes under the Federal Reclamation Laws, prior to the time when they are needed in connection with the construction or operation and maintenance of a reclamation project, can best be utilized for the grazing of livestock; and

2. Whereas many of such withdrawn lands are or may be located within the exterior boundaries of grazing districts established under the Taylor Grazing Act of June 28, 1934 (48 Stat. 1269), as amended, without being a part of a grazing district, the Secretary of the Interior not having approved the inclusion of them in a district; and

3. Whereas range administration of such withdrawn lands can best be effected by the Grazing Service, particularly since the same stock graze part time on grazing-district lands and part time on such withdrawn lands; and

4. Whereas the grazing fees fixed by the Secretary of the Interior for the use of grazing-district lands adjacent to such withdrawal and of similar value for grazing purposes are adequate to provide a reasonable return to the Reclamation fund for the use of most of such withdrawn lands.

5. The Bureau of Reclamation will, from time to time, submit to the Grazing Service lists describing such withdrawn lands as it desires to have administered by the Grazing Service pursuant to the terms of this understanding; and the Grazing Service will notify the Bureau of Reclamation as to which of the lands so listed it will administer pursuant to the terms of this understanding, including in such notice the date when it will assume administrative control over said lands.

6. Such lands as, pursuant to paragraph 5 hereof, the Grazing Service administers for grazing purposes shall be administered by said Service in accordance with the Federal Range Code unless otherwise expressly provided herein. It is agreed (1) that the grazing fees for such lands shall not be less than that fixed for grazing-district lands

adjacent to such withdrawn lands and of similar value for grazing purposes; (2) that no refund of a grazing fee for any of such lands shall be made unless application therefor is made within 30 days after the expiration of the grazing period described in the license; (3) that the Grazing Service shall make every reasonable effort to obtain final disposition of such applications for refunds within five months from the receipt of any such application; (4) that subject to "(2)" above, refunds of grazing fees for any of such lands, which may be made by the Grazing Service, shall be deducted from the grazing fees collected for the lands before payment is made to the Bureau of Reclamation as provided in paragraph 8 hereof.

7. On all licenses and permits issued by the Grazing Service involving lands covered in this memorandum, there shall be noted in conspicuous type the following: "See stipulations attached hereto and made a part hereof." The attachment will set forth in clear and concise language any provisions which are required to conform to the terms of this memorandum and which are not in accord with the Federal Range Code.

8. The Grazing Service shall pay to the Bureau of Reclamation for disposal under the applicable Federal Reclamation Laws the grazing fees collected in connection with the lands placed under the administration of the Grazing Service pursuant to this agreement, less such refunds of such fees as may be made in accordance with the provisions of paragraph 6 of this memorandum. The amount of grazing fees for such lands shall be computed on the basis of actual use thereof at the same rate of charge as for adjacent grazing-district lands, except that, in special cases where the reclamation withdrawn lands have a higher grazing value or for some other reason are of greater value than the grazing-district lands, a higher rate of fees may be set. Said payments shall be made to the Bureau of Reclamation by the Grazing Service annually upon a calendar year basis. The accounting for such payments shall be in such manner, agreed upon by the Grazing Service and the Bureau of Reclamation, as will meet the accounting requirements of both.

9. Any lands placed under the administration of the Grazing Service pursuant to this understanding, including lands covered by outstanding licenses or permits, may be withdrawn therefrom by the Bureau of Reclamation upon the giving of twelve months' notice in writing to the Grazing Service.

H. W. Bashore

Acting Commissioner, Bureau of Reclamation

Julian Terrett

Approved: April 29, 1941 Acting Director of Grazing

E. K. Burlew

First Assistant Secretary

MEMORANDUM OF AGREEMENT

Between

BUREAU OF LAND MANAGEMENT

and

BUREAU OF RECLAMATION

**Transfer of Funds**
**for**
**Picacho Arroyo Control Program**

**September 18, 1952**

MEMORANDUM OF AGREEMENT

The Bureau of Land Management agrees to contribute $10,000 in connection with the Picacho Arroyo Control Program to be contracted by the Bureau of Reclamation.

The Bureau of Land Management will immediately transfer funds to the Bureau of Reclamation upon receipt of S.F. 1080.

Upon completion and acceptance of the work performed on the contract, the Bureau of Reclamation will so advise the Bureau of Land Management in order that their files may be closed.

Date 9/25/52

/s/ George H. Woodhall
Reg. Chief, Division of Administration
Bureau of Land Management

/s/ R. S. Bristol
Acting Regional Director
Bureau of Reclamation, Region 5

Date: September 18, 1952

BUREAU OF LAND MANAGEMENT

and

BUREAU OF RECLAMATION

Dated October 24, 1952

# Aministration of Grazing Privileges on Caballo Reservoir Lands

(Revised list - Supersedes all previous lists)

October 24, 1952

Eng

Mr. E. R. Smith
Regional Administrator
Bureau of Land Management
Albuquerque, New Mexico

Dear Mr. Smith:

Please refer to the Memorandum of Understanding between the Grazing Service and the Bureau of Reclamation approved April 29, 1941, and to the Supplemental Memorandum of Understanding approved October 5, 1942, transferring to the Bureau of Land Management the administration of grazing privileges on certain lands in the Caballo Reservoir area. We have no evidence that the original listing has ever been revised, but are aware that the status of quite a bit of the land has changed in the last ten years.

Recently questions have arisen concerning the extent of the area to be administered by the Bureau of Land Management and in order that the records may be brought up to date and in accordance with the provisions of Article 5 of the Memorandum of Understanding, approved April 29, 1941, we have prepared a new list covering all lands, both acquired and withdrawn, in the Caballo Reservoir Area on which the Bureau of Reclamation at this time wishes the Bureau of Land Management to administer grazing privileges. This list supersedes any issued previously, including the one issued in 1942 as part of the Memorandum of Understanding. So that there will be no misunderstanding regarding the status of the other lands in this area which are now, or were, at one time under Reclamation jurisdiction, we have compiled additional listings indicating the existing or desired status of these lands.

At this time we are transmitting the following data. These data supersede all previous listings.

1. "Lands To Be Administered By Grazing Service, Dated October 1952." (3 sheets)
   Please note that this list includes the lands in the old Las Palomas Townsite, which lands we wish at this time to transfer for your administration. A detailed description of this area is shown on Drawing No. 4084-R-37 (Rev. 9-29-52), which is attached. Lands listed in Item 2 below are not included in this listing.

2. "Lands On Which Transfer For Administration Of Grazing Privileges Is Revoked, Dated October 1952." (1 sheet) These lands are required in connection with recreational facilities in the area and it is requested, in accordance with Article 6 (1) of the Supplemental Memorandum of Under-Standing, approved October 5, 1942, that they be returned for Reclamation administration. It is understood, of course, that completion of this transfer will be subject to present leasing agreements.

3. "Lands Administered by Bureau Of Reclamation, Dated October 1952." (1 sheet)
This list includes lands required for O&M at Caballo Dam and lands below the Dam that are leased for agricultural use.

4. "1st Form Reclamation Withdrawal Revoked, August 11, 1944." (1 sheet) This list includes Public Withdrawn Lands that were restored as Public Domain when it was found that they were not required in connection with operation or maintenance of Caballo Dam and Reservoir. Please note that in T. 16 S., R. 4 W., areas in Section 19 and Section 30 were restored and later returned to withdrawn status. These areas are included under Item 1 above.

5. Drawing No. 4011-R-63-V (Rev. August 1944). This map is colored to indicate the various areas referred to above.

6. Drawing No. 4084-R-37 (Rev. 9-29-52). This map shows in detail the area of the Las Palomas Townsite which was acquired by condemnation in 1944. It is our wish that you assume responsibility for administration of grazing privileges of this area.

We sincerely appreciate the service rendered by your organization and if additional information is required in connection with this matter, do not hesitate to call on us.

Very truly yours,

W. F. Resch
Project Manager

Enclosures

Copy to: Mr. M.A. Trogstad, Area Manager
Bureau of Land Management, Deming, New Mexico

Mr. J.R. Ahl, Area Manager,
Bureau of Land Management, Alamogordo, New Mexico

Regional Director, Bureau of Reclamation, Amarillo, Texas
(each w/c of enclosures)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

RIO GRANDE PROJECT, NEW MEXICO-TEXAS
CABALLO RESERVOIR SITE

LANDS TO BE ADMINISTERED BY GRAZING SERVICE

October 1952

(This list supersedes all previous lists)

Acquired Lands

Township 14 South, Range 4 West, New Mexico Principal Meridian

Sec. 7 - $E\frac{1}{2}$, Less Lot 5
$E\frac{1}{2}W\frac{1}{2}$
$W\frac{1}{2}NW\frac{1}{4}$ East of Highway
$NW\frac{1}{4}SW\frac{1}{4}$ East of Highway
Sec. 8 - $W\frac{1}{2}SW\frac{1}{4}$
Sec. 17 - $W\frac{1}{2}E\frac{1}{2}$, $W\frac{1}{2}$
Sec. 18 - $E\frac{1}{2}$, $E\frac{1}{2}W\frac{1}{2}$
$W\frac{1}{2}NW\frac{1}{4}$ East of Highway
$NW\frac{1}{4}SW\frac{1}{4}$ East of Highway
Sec. 19 - $E\frac{1}{2}$, $E\frac{1}{2}NW\frac{1}{4}$, $NE\frac{1}{4}SW\frac{1}{4}$
$SE\frac{1}{4}SW\frac{1}{4}$ East of Highway
Sec. 20 - $W\frac{1}{2}E\frac{1}{2}$, $E\frac{1}{2}SW\frac{1}{4}$, $SW\frac{1}{4}SW\frac{1}{4}$
Sec. 29 - $W\frac{1}{2}E\frac{1}{2}$, $W\frac{1}{2}$
Sec. 30 - $E\frac{1}{2}NE\frac{1}{4}$, East 940' of $NE\frac{1}{4}NW\frac{1}{4}$
Parts of $S\frac{1}{2}NE\frac{1}{4}$ and $SE\frac{1}{4}$ (Las Palomas Townsite - 216.85 Acres - see attached drawing No. 4084-R-37 Rev 9/29/52)
Sec. 31 - $E\frac{1}{2}NE\frac{1}{4}$, $NW\frac{1}{4}NE\frac{1}{4}$, $SE\frac{1}{4}$
Sec. 32 - $NW\frac{1}{4}NE\frac{1}{4}$, $NE\frac{1}{4}NW\frac{1}{4}$, $W\frac{1}{2}W\frac{1}{2}$

Township 15 South, Range 4 West, New Mexico Principal Meridian

Sec. 5 - $W\frac{1}{2}NE\frac{1}{4}$, $W\frac{1}{2}$, $SE\frac{1}{4}$
Sec. 6 - $E\frac{1}{2}$, $SE\frac{1}{4}NW\frac{1}{4}$, $E\frac{1}{2}SW\frac{1}{4}$
Sec. 7 - All
Sec. 8 - All
Sec. 17 - $W\frac{1}{2}NE\frac{1}{4}$, $NE\frac{1}{4}NW\frac{1}{4}$, $W\frac{1}{2}W\frac{1}{2}$, $NE\frac{1}{4}SW\frac{1}{4}$, $NW\frac{1}{4}SE\frac{1}{4}$
Sec. 18 - All
Sec. 19 - $E\frac{1}{2}$, $NW\frac{1}{4}$, $E\frac{1}{2}SW\frac{1}{4}$, $SW\frac{1}{4}SW\frac{1}{4}$
Sec. 20 - $W\frac{1}{2}NW\frac{1}{4}$, $SE\frac{1}{4}NW\frac{1}{4}$, $SW\frac{1}{4}$
Sec. 29 - $W\frac{1}{2}NW\frac{1}{4}$, $SE\frac{1}{4}NW\frac{1}{4}$, $NW\frac{1}{4}SW\frac{1}{4}$
Sec. 30 - All
Sec. 31 - $W\frac{1}{2}E\frac{1}{2}$, $W\frac{1}{2}$

CABALLO RESERVOIR SITE

Withdrawn Lands

Township 16 South, Range 4 West, New Mexico Principal Meridian

Sec. 6 - NW¼NE¼ or Lots 2 and 7
W½, SW¼SE¼
Sec. 7 - W½NE¼, W½, NW¼SE¼
Sec. 18 - W½W½, SE¼SE¼SW¼, S½SW¼SE¼
Sec. 19 - N½NE¼NE¼, NW¼, NW¼SE¼
Sec. 30 - That part of E½NW¼ and NE¼SW¼ lying east of west bank of river.

Township 15 South, Range 5 West, New Mexico Principal Meridian

Sec. 12 - SE¼SE¼
Sec. 13 - NE¼NE¼
Sec. 25 - SE¼NE¼,
SW¼NE¼ East of Highway
E½SW¼ East of Highway
SE¼
Sec. 36 - SE¼NE¼

Township 16 South, Range 5 West, New Mexico Principal Meridian

Sec. 1 - E½E½, SE¼SW¼, SW¼SE¼
Sec. 12 - E½, E½NW¼
Sec. 23 - E½SW¼, N½SE¼, SE¼SE¼
Sec. 24 - SW¼SW¼
Sec. 25 - N½NW¼, SW¼NW¼, W½SW¼
Sec. 26 - N½NE¼

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Public Withdrawn Lands

Township 14 South, Range 4 West, New Mexico Principal Meridian

Sec. 4 - SW¼SW¼ (Lot 12)
Sec. 5 - Lots 5 and 6 (Part S½SE¼)
Sec. 7 - SW¼SW¼
Lot 5 (In SW¼SE¼)
Sec. 8 - N½NW¼, SE¼SW¼
Sec. 17 - E½SE¼
Sec. 18 - SW¼SW¼
Sec. 19 - W½NW¼, NW¼SW¼
Sec. 20 - E½E½, NW¼, NW¼SW¼
Sec. 29 - E½NE¼, NE¼SE¼
Sec. 31 - SW¼NE¼
Sec. 32 - SE¼NW¼, E½SW¼

Township 15 South, Range 4 West, New Mexico Principal Meridian

Sec. 4 - SW¼SW¼
Sec. 5 - SE¼NE¼

## CABALLO RESERVOIR SITE

### Public Withdrawn Lands

**Township 15 South, Range 4 West, New Mexico Principal Meridian (Cont'd.)**

Sec. 6 - NE¼NE¼, W½SW¼
Sec. 9 - NW¼NW¼
Sec. 17 - NE¼NE¼, SE¼NW¼, SE¼SW¼, SW¼SE¼
Sec. 19 - NW¼SW¼
Sec. 20 - W½NE¼, NE¼NW¼
Sec. 29 - NE¼NW¼, NE¼SW¼

**Township 16 South, Range 4 West, New Mexico Principal Meridian**

Sec. 6 - E½E½, SW¼NE¼, NW¼SE¼
Sec. 7 - E½E½, SW¼SE¼
Sec. 18 - W½NE¼, E½NW¼, NE¼SW¼, W½SE¼SW¼, NE¼SE¼SW¼, NW¼SE¼, E½SW¼SE¼
Sec. 19 - S½NW¼NE¼, SW¼NE¼, NE¼SE¼, SW¼SE¼
Sec. 30 - NW¼NE¼, SE¼SW¼

**Township 15 South, Range 5 West, New Mexico Principal Meridian**

Sec. 12 - NE¼SE¼
Sec. 25 - NE¼NE¼
Sec. 36 - N½NE¼, SW¼NE¼, NW¼, SE¼

**Township 16 South, Range 5 West, New Mexico Principal Meridian**

Sec. 1 - W½NE¼, N½SW¼, SW¼SW¼, NW¼SE¼
Sec. 12 - S½NW¼, SW¼
Sec. 23 - SW¼SE¼
Sec. 24 - NW¼SW¼
Sec. 25 - NE¼

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

RIO GRANDE PROJECT, NEW MEXICO-TEXAS
CABALLO RESERVOIR SITE

LANDS ON WHICH TRANSFER FOR ADMINISTRATION
OF GRAZING PRIVILEGES IS REVOKED

October 1952

A. Acquired Lands

Township 16 South, Range 5 West, New Mexico Principal Meridian

Sec. 13 - E½, NW¼
Sec. 24 - E½NE¼, NW¼NE¼

B. Public Withdrawn Lands

Township 16 South, Range 5 West, New Mexico Principal Meridian

Sec. 13 - SW¼
Sec. 24 - SW¼NE¼, E½NW¼

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

RIO GRANDE PROJECT, NEW MEXICO-TEXAS
CABALLO RESERVOIR SITE

LANDS ADMINISTERED BY BUREAU OF RECLAMATION

October 1952

1. CABALLO RESERVOIR CONTROL AREA

A. Acquired Lands

Township 16 South, Range 4 West, New Mexico Principal Meridian

Sec. 19 - E½SW¼
Sec. 30 - That part of N½N½NW¼ lying West of the west bank of river.

Township 16 South, Range 5 West, New Mexico Principal Meridian

Sec. 24 - E½SW¼

B. Public Withdrawn Lands

Township 16 South, Range 4 West, New Mexico Principal Meridian

Sec. 19 - W½SW¼

Township 16 South, Range 5 West, New Mexico Principal Meridian

Sec. 24 - SE¼

2. AGRICULTURAL LAND

Acquired Land

Township 16 South, Range 4 West, New Mexico Principal Meridian

Sec. 30 - That part of S½N½NW¼, SE¼NW¼, and NE¼SW¼ lying west of the west bank of river.

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

RIO GRANDE PROJECT, NEW MEXICO-TEXAS
CABALLO RESERVOIR SITE

FIRST FORM RECLAMATION WITHDRAWAL
REVOKED (August 11, 1944)

Township 14 South, Range 4 West, New Mexico Principal Meridian

Sec. 8 - $N\frac{1}{2}NE\frac{1}{4}$, $NE\frac{1}{4}SW\frac{1}{4}$
Sec. 17 - $E\frac{1}{2}NW\frac{1}{4}$
Sec. 19 - $SW\frac{1}{4}SW\frac{1}{4}$
Sec. 29 - $SE\frac{1}{4}SE\frac{1}{4}$
Sec. 30 - $NW\frac{1}{4}NW\frac{1}{4}$
Sec. 32 - $NE\frac{1}{4}NE\frac{1}{4}$, $S\frac{1}{2}NE\frac{1}{4}$, $SE\frac{1}{4}$

Township 15 South, Range 4 West, New Mexico Principal Meridian

Sec. 4 - Lot 6, $E\frac{1}{2}SW\frac{1}{4}$
Sec. 5 - Lot 1
Sec. 6 - Lots 4, 5
Sec. 9 - Lot 2, $E\frac{1}{2}NW\frac{1}{4}$
Sec. 17 - $SE\frac{1}{4}NE\frac{1}{4}$, $E\frac{1}{2}SE\frac{1}{4}$
Sec. 20 - $E\frac{1}{2}NE\frac{1}{4}$
Sec. 29 - $E\frac{1}{2}SW\frac{1}{4}$
Sec. 31 - $E\frac{1}{2}E\frac{1}{2}$

Township 16 South, Range 4 West, New Mexico Principal Meridian

Sec. 18 - $E\frac{1}{2}E\frac{1}{2}$
Sec. 19 - $S\frac{1}{2}NE\frac{1}{4}NE\frac{1}{4}$, $SE\frac{1}{4}NE\frac{1}{4}$, $S\frac{1}{2}SE\frac{1}{4}$ -*$SW\frac{1}{4}SE\frac{1}{4}$
Sec. 20 - $S\frac{1}{2}N\frac{1}{2}S\frac{1}{2}N\frac{1}{2}SW\frac{1}{4}$, $S\frac{1}{2}S\frac{1}{2}N\frac{1}{2}SW\frac{1}{4}$, $NW\frac{1}{4}SE\frac{1}{4}$, $SW\frac{1}{4}NE\frac{1}{4}SE\frac{1}{4}$, $S\frac{1}{2}S\frac{1}{2}$
Sec. 21 - $SW\frac{1}{4}SW\frac{1}{4}$
Sec. 30 - $NE\frac{1}{4}$ -*$NW\frac{1}{4}NE\frac{1}{4}$

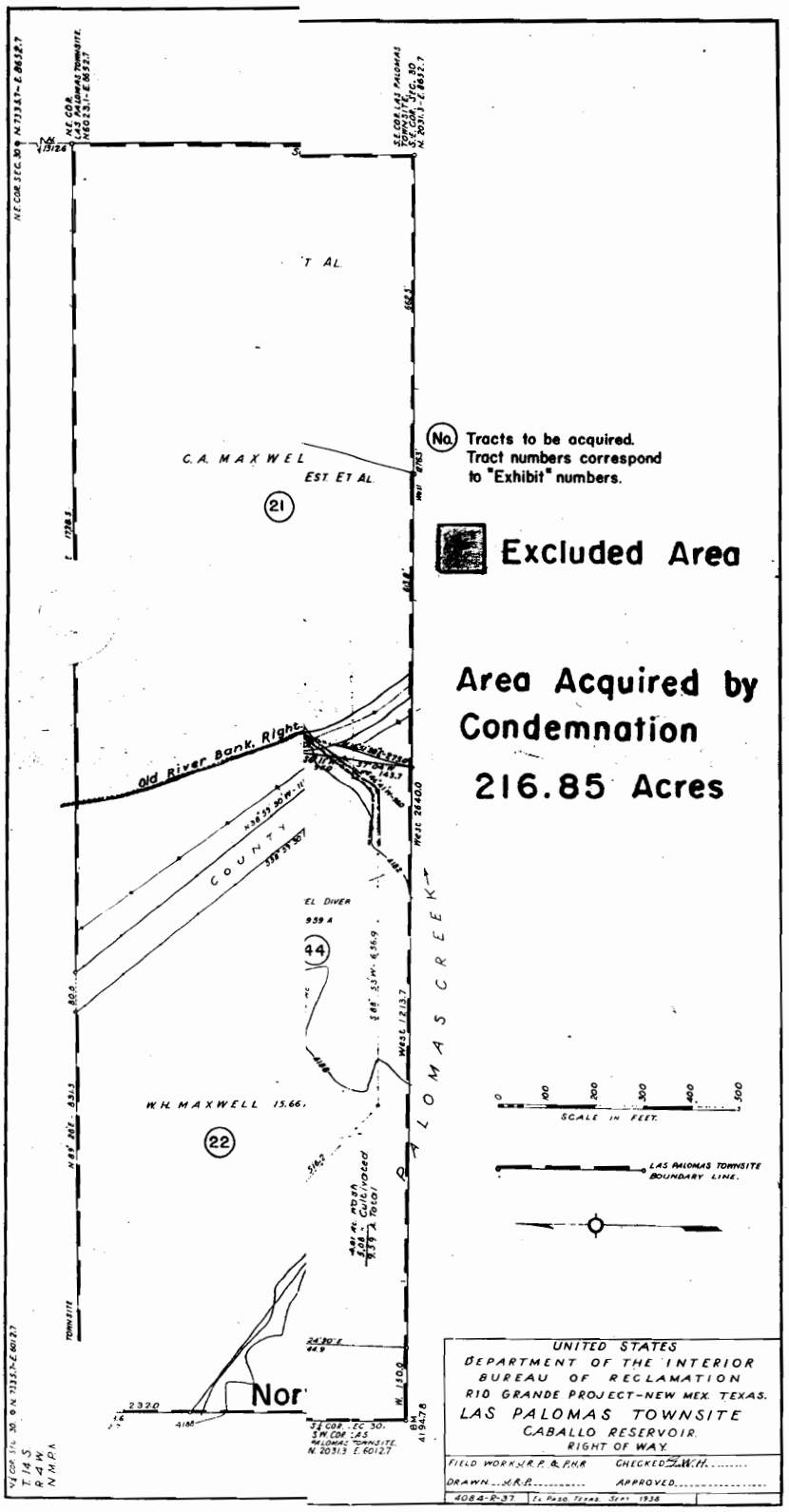
*- $SW\frac{1}{4}SE\frac{1}{4}$ Sec. 19 and $NW\frac{1}{4}NE\frac{1}{4}$ Sec. 30 included by error and requested to be returned to withdrawal Nov. 15, 1945. Order approved March 28, 1945.

Township 15 South, Range 5 West, New Mexico Principal Meridian

Sec. 12 - $W\frac{1}{2}SE\frac{1}{4}$
Sec. 13 - $NW\frac{1}{4}NE\frac{1}{4}$, $S\frac{1}{2}NE\frac{1}{4}$, $SE\frac{1}{4}$
Sec. 25 - $NW\frac{1}{4}NE\frac{1}{4}$, $W\frac{1}{2}SW\frac{1}{4}$
Sec. 36 - $SW\frac{1}{4}$

Township 16 South, Range 5 West, New Mexico Principal Meridian

Sec. 1 - $S\frac{1}{2}NW\frac{1}{4}$
Sec. 26 - $W\frac{1}{2}NE\frac{1}{4}$


NE COR. SEC. 30 N. 7333.1 E. 8652.7
NE COR. LAS PALOMAS TOWNSITE N 6023.1 E 8652.7
SE COR. LAS PALOMAS TOWNSITE S.E. COR. SEC. 30 N. 2031.3 E 8652.7
T AL.
C. A. MAXWEL EST ET AL.
21
No. Tracts to be acquired. Tract numbers correspond to "Exhibit" numbers.
Excluded Area
Area Acquired by Condemnation
216.85 Acres
Old River Bank, Right
COUNTY
EL DIVER
939 A
44
W. H. MAXWELL 15.66.
22
PALOMAS CREEK
0 100 200 300 400 500
SCALE IN FEET.
LAS PALOMAS TOWNSITE BOUNDARY LINE.
UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
RIO GRANDE PROJECT-NEW MEX. TEXAS.
LAS PALOMAS TOWNSITE
CABALLO RESERVOIR
RIGHT OF WAY
FIELD WORK H.R.P. & P.M.R. CHECKED J.W.H.
DRAWN H.R.P. APPROVED
4084-R-37 El Paso, Texas Sept. 1938

MEMORANDUM OF AGREEMENT

Between

BUREAU OF LAND MANAGEMENT

and

BUREAU OF RECLAMATION

Transfer of Funds
for
Picacho Arroyo Control Program

September 2, 1953

C O P Y mcf

Contract No. 14-06-500-45

MEMORANDUM OF AGREEMENT

The Bureau of Land Management agrees to contribute ten thousand dollars ($10,000.) for use in fiscal year 1954 in connection with the Picacho Arroyo Control Program to be contracted by the Bureau of Reclamation.

The Bureau of Land Management will transfer funds immediately upon receipt of S.F. 1080, however, such transfer shall not be made before the second quarter of fiscal year 1954.

Upon completion and acceptance of the work performed on the contract, the Bureau of Reclamation shall furnish the Bureau of Land Management a listing of contract items considered as being paid from the contribution in order that their files may be closed.

Date: Sept. 2, 1953

/s/ E. R. Smith
Regional Administrator
Bureau of Land Management

Date: August 26, 1953

/s/ R. S. Bristol
R. S. Bristol
Acting Regional Director
Region 5
Bureau of Reclamation

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
RIO GRANDE PROJECT - NEW MEXICO-TEXAS

SUPPLEMENTAL MEMORANDUM OF UNDERSTANDING NO. 2

THIS SUPPLEMENTAL MEMORANDUM OF UNDERSTANDING, made and entered into this 17th day of July 19 64, by and between the Bureau of Reclamation, Department of the Interior, represented by the officer executing this Memorandum, and the Bureau of Land Management, Department of the Interior, represented by the officer executing this Memorandum.

WITNESSETH:

1. WHEREAS, the Bureau of Reclamation, and the Bureau of Land Management (formerly Grazing Service) have heretofore entered into a Memorandum of Understanding approved by the First Assistant Secretary of the Interior on April 29, 1941, providing for cooperation in the administration of lands withdrawn for reclamation purposes; and

2. WHEREAS, a Supplemental Memorandum of Understanding was entered into on the 1st day of June 1948 between the Bureau of Reclamation, Department of the Interior, and the Grazing Service, now Bureau of Land Management, Department of the Interior, which broadened the intent of the original Memorandum of Understanding to include private lands acquired for the Elephant Butte Reservoir, Rio Grande Project, in addition to withdrawn lands under First Form Withdrawal; and

3. WHEREAS, it is now desired to make available to the Bureau of Land Management land not included in the previously-submitted lists of land which the Bureau of Land Management was to administer for grazing purposes.

NOW THEREFORE, the parties hereto agree as follows:

4. The Bureau of Land Management will administer, in accordance with the said Memorandum of Understanding of April 29, 1941, and in accordance with the stipulations contained in the Supplemental Memorandum of Agreement of June 1, 1948, all lands in Elephant Butte Reservoir withdrawn or acquired by purchase or condemnation lying north of the north boundary of Parcel No. 2, Armendariz Grant No. 33, as shown on Exhibit A attached hereto and made a part hereof; excepting, however, the right of way strip in the upper end of Elephant Butte Reservoir under lease to the Atchison, Topeka and Santa Fe Railway Company, being generally a strip 150 feet in width, occupied by the embankment and tracks of the Atchison, Topeka and Santa Fe Railway Company, in general between railroad mile posts 1007 and 1008. This map, Exhibit A, is to be considered as a list as

referred to in the original Memorandum of Understanding of April 29, 1941, and in the Supplemental Memorandum of Understanding of June 1, 1948, and for the additional listing of lands being made available under this Supplemental Memorandum of Understanding No. 2, as well as including that previously listed.

5. This Supplemental Memorandum of Agreement No. 2 is subject to all stipulations and reservations as set forth in the Supplemental Memorandum of Understanding of June 1, 1948, except that in 6(1) the designation "Superintendent of the Bureau of Reclamation" is changed to "Project Manager of the Rio Grande Project, Bureau of Reclamation" and in addition, the following stipulations and reservations are made:

(1) Temporary fences will be permitted across the floodway. Each such temporary fence will include two large gates (located in cooperation with the local maintenance officer) on either side of the floodway to allow movement of heavy equipment up and down the floodway. Each such temporary fence also will include two cattle guards (located in cooperation with the local maintenance officer) constructed to support heavy equipment--one on the levee bank and one on the canal bank. Such temporary fences will be removed by the fence permittees, without cost to the United States, upon reasonable notice from the local maintenance officer to allow for any necessary brush clearing or other maintenance work. In cases of high water, the [illegible] crew is authorized to cut such temporary fences as may be necessary to allow logs, debris, trash, weeds, etc., to drift on downstream. Upon notification by the United States the fence permittee will remove any temporary fence authorized hereunder within such reasonable period of time as specified by the United States.

(2) The conveyance channel and floodway from the reservoir boundary, south of San Marcial, through the reservoir to approximately the upper end of the Narrows is specifically reserved for all purposes of operation, maintenance, and administration by Bureau of Reclamation personnel.

6. Nothing herein changes the stipulations, restrictions, or agreement contained in the aforementioned Memorandum of Understanding approved April 29, 1941, and in the Supplemental Memorandum of Understanding dated June 1, 1948.

IN WITNESS WHEREOF, the parties hereto have executed this Supplemental Memorandum of Understanding No. 2 as of the date first hereinabove mentioned.

BUREAU OF LAND MANAGEMENT

By W. J. Anderson
Acting State Director

BUREAU OF RECLAMATION

/s/ W. F. Resch

By _____
W. F. Resch, Project Manager
Rio Grande Project

UNITED STATES DEPARTMENT OF THE INTERIOR

MEMORANDUM OF AGREEMENT

BUREAU OF LAND MANAGEMENT
AND
BUREAU OF RECLAMATION

THIS MEMORANDUM OF AGREEMENT, made and entered into by the Bureau of Land Management, Department of the Interior, represented by the officer executing this memorandum, and the Bureau of Reclamation, Department of the Interior, represented by the officer executing this memorandum:

WITNESSETH:

1. WHEREAS, the Mexican duck (Anas diazi) is declared by the United States Department of the Interior, Bureau of Sport Fisheries and Wildlife to be an endangered species; and
2. WHEREAS, land suitable for nesting habitat development for the species is present on the described lands presently withdrawn for or acquired by the Bureau of Reclamation; and
3. WHEREAS, marsh drainage has restricted habitat for the double-crested cormorant (Phalacrocorax auritus) and black-crowned night heron (Nycticorox nycticorox), both of which nest in the described lands, for which protection and propagation of habitat is desirable; and
4. WHEREAS, it is desirable for the enhancement of endangered American wildlife to make specific land areas available to the Bureau of Land Management for the purpose of wildlife habitat management.

NOW THEREFORE, the parties hereto agree as follows:

1. The Bureau of Reclamation will permit the Bureau of Land Management use of the land lying west of the main canal in Township 10 South, Range 3 West, Section 20, W½, W½E½ and Section 29, NW¼, NW¼NE¼, for development and administration for wildlife habitat.

2. The Bureau of Reclamation shall retain administrative control of the lands to the extent of its responsibility for administering the Rio Grande Reclamation Project, and in the event the wildlife habitat project is discontinued, and upon notification in writing to the Bureau of Reclamation, all administrative control over the above-described lands shall revest in the Bureau of Reclamation.

3. Permission or consent of the Bureau of Land Management shall not be required of Bureau of Reclamation personnel prior to performance of any authorized functions of the Rio Grande Reclamation Project, including specifically, but not by way of limitation, the controlling of water use and reservoir levels and the use of the lands for phreatophyte management programs.

4. The Bureau of Reclamation will notify the Bureau of Land Management in writing of future land use program changes for the above-described lands to permit mitigation of damage, if any, to the wildlife habitat development project.

5. Bureau of Reclamation personnel will have unrestricted access to the subject area at all times; however, entry into the area during the nesting season will be in a manner so as not to unreasonably disturb the area and only to perform operations necessary for the reclamation project.

IN WITNESS WHEREOF, the parties hereto have executed this MEMORANDUM OF AGREEMENT.

| BUREAU OF RECLAMATION | BUREAU OF LAND MANAGEMENT |
|---|---|
| By James W. Kirby | By W. J. Anderson<br>STATE DIRECTOR |
| Date: Nov. 24, 1970 | Date: October 19, 1970 |

(Blanket)

Mar. 2, 1972

MEMORANDUM OF AGREEMENT
Between
THE BUREAU OF RECLAMATION AND THE BUREAU OF LAND MANAGEMENT

Section 1 - Purpose. This agreement sets forth the principles and procedures for coordination of Bureau of Reclamation (Reclamation) and Bureau of Land Management (Land Management) programs.

Section 2 - Authority. Through delegation of authority from the Secretary of the Interior, the Bureau of Reclamation investigates, formulates, designs, constructs, operates, and maintains multi-purpose projects for the storage, diversion, and utilization of water, land and related resources including transmission of electric power pursuant to the Reclamation Act of June 17, 1902 (43 U.S.C., Chapter 12), as amended and supplemented.

Through delegation of authority from the Secretary of the Interior, the Bureau of Land Management administers certain public lands pursuant to the Taylor Grazing Act of June 28, 1934 (43 U.S.C. 315 et seq.), as amended and supplemented; the Oregon and California Revested Lands Act of August 28, 1937 (43 U.S.C. 1181 et seq.), as amended and supplemented; the Mining Law (30 U.S.C., Chapter 2); the Materials Act (30 U.S.C. 601 et seq.); the Mineral Leasing Act (30 U.S.C. 181 et seq.); and a variety of other public land laws.

The two Bureaus have also been delegated some authority and responsibility under other laws, such as the Fish and Wildlife Coordination Act of 1965 (16 U.S.C. 661 et seq.); the Federal Water Project Recreation Act of 1965 (16 U.S.C. 460 l-4); the Soil Conservation and Domestic Allotment Act of 1935 (16 U.S.C. 590a-590e); and the National Environmental Policy Act of 1969 (43 U.S.C. 4321-47).

Section 3 - Planning for Reclamation Projects. When Reclamation undertakes planning studies and investigations, the consequences of which may affect lands or programs administered by Land Management, Reclamation will consult with BLM to determine potential impacts on Land Management lands and programs, to identify Reclamation needs for Land Management lands or interests in lands, and to harmonize and coordinate to the maximum feasible extent Land Management planning on BLM lands with Reclamation project planning. To this end, Land Management will furnish for inclusion in Reclamation studies and reports pertinent information concerning BLM lands and programs, analyses of impacts, and recommendations.

Section 4 - Planning for Land Management. When Land Management undertakes planning studies and investigations of any type, the consequences of which may affect lands administered by Reclamation, Land Management will consult with Reclamation to determine potential impacts on Reclamation withdrawn and acquired lands, (hereinafter called "Reclamation lands") and programs to identify Reclamation needs for Land Management lands or interests in lands, and to harmonize and coordinate to the maximum feasible extent Land Management plans and programs with Reclamation plans and programs. Land Management will incorporate in its District Management Profiles and other parts of its planning system information reflecting Reclamation needs and interests.

Enclosure 1

Section 5 - Supplemental Land and Resource Management Agreements.

A. Supplemental agreements and interim working arrangements may be made by field officials of Reclamation and Land Management. Agreements will cover specific procedures and responsibilities for administration of Reclamation lands and adjacent or otherwise related Land Management lands.

Agreements will be signed by Land Management State Director and Reclamation Regional Director. Supplemental agreements may be initiated by either Reclamation or Land Management.

B. The following guidelines will apply to all supplemental agreements, unless waivers are obtained from both the Director, Land Management, and the Commissioner, Reclamation:

1. Unless otherwise directed by the Secretary, or agreed to mutually by Reclamation and Land Management pursuant to the terms and guidelines of this agreement, Reclamation will retain full responsibility for management of Reclamation lands on authorized or constructed Reclamation projects, and Land Management will retain full responsibility for management of other Reclamation lands which are not within the boundaries of national forests or other agency reservations.

2. In the exercise of its delegated responsibilities on Reclamation lands (such as those relating to the U. S. mining and mineral leasing laws, rights-of-way, and cadastral surveys other than farm-unit surveys, and the Recreation and Public Purposes Act), Land Management actions shall be subject to the concurrence of Reclamation and to such special stipulations and terms and conditions as may be determined necessary by Reclamation to protect the lands for Reclamation purposes.

3. Within the restraints of delegated authority, management responsibilities may be transferred from either agency to the other, subject to the following:

(a) Overall efficiency and effectiveness of government operations will be a major objective.

(b) Grazing.

(1) Land Management will administer grazing on all Reclamation lands not within the boundaries of authorized or constructed Reclamation projects in accordance with the provisions of Part 603 of

the Departmental Manual and the applicable parts of Title 43 of the Code of Federal Regulations.

(ii) Land Management may also administer grazing on Reclamation lands on authorized or constructed projects. When Land Management administers such lands, it shall administer them in the same manner as it administers grazing on other public lands as provided in the applicable parts of Title 43 of the Code of Federal Regulations, unless otherwise specified in supplemental agreements applicable to the particular Reclamation project on which the lands are located.

(iii) All grazing leases or permits issued by Land Management for Reclamation lands shall be subject to such special stipulations as may be determined necessary by Reclamation to protect the lands for Reclamation purposes.

(iv) When continuance of administration of grazing by Land Management on Reclamation lands on authorized or constructed Reclamation projects is determined by Reclamation to be inconsistent with Reclamation programs, Reclamation may terminate such administration upon not less than one year's notice to Land Management if such 12-months' notice is served during the grazing season. However, jurisdiction of the lands may be returned to Reclamation on shorter notice pursuant to special arrangements mutually agreeable between the two agencies during the nongrazing season or if the lands are not being leased for grazing.

(v) The grazing revenues from Reclamation lands administered by Land Management outside the boundaries of authorized or constructed projects shall be deposited to the U.S. Treasury account 145016, Receipts from grazing, etc., public lands outside grazing districts and distributed in accordance with 43 U.S.C. 3151. Land Management will not account to Reclamation for such grazing receipts. All grazing receipts collected by Land Management from Reclamation lands located on authorized or constructed project areas shall be deposited directly to U.S. Treasury account 145000, principal repayments, loan program, reclamation funds. The Bureau of Reclamation will be furnished concurrent with the deposit by Land Management a copy of the certificate of deposit showing the date of deposit, fund symbol, amount and reclamation project number.

(c) Timber:

(i) When the construction of reservoirs on Federal Reclamation projects requires the removal of timber from Reclamation lands outside of national forests, the sale of timber from such lands will be conducted by Land Management in accordance with its regulations and authorities. Proposals for the sale of timber may be initiated by

either agency. Timber sale proposals by Land Management will be submitted to the appropriate Regional Director of Reclamation for advance approval. All sale proposals will indicate estimates of costs, receipts, and other pertinent information. Established rules of forest practice shall not apply to sales made for the clearing of reservoirs, damsites, or other construction areas designated by Reclamation.

(ii) Land Management shall retain 100 percent of all timber sale revenue from Reclamation lands which are outside the area of an authorized or constructed Reclamation project. Timber sale receipts from Reclamation lands on an authorized or constructed Reclamation project shall be deposited to 145034, "Receipt from sale of timber, etc., on Reclamation lands." As of June 30 and December 31 each year, the following distribution shall be made: (1) To account 14X5034, Expenses, sale of timber, etc., on Reclamation lands, an amount equal to the actual costs incidental to sale or 10 percent of such revenue, whichever is less, shall be transferred to this account by appropriation warrant by Treasury upon request made by BLM; and (2) Collections in excess of costs in (1) shall be transferred to 145000, Receipts, Reclamation Fund.

(d) Recreation - When Land Management lands have recreation values related to recreation values on Reclamation lands on authorized or constructed Reclamation projects, consultation with theBureau of Outdoor Recreation, National Park Service, State and local recreation agencies, and other appropriate interests will include consideration of all the values involved, and all the alternatives for administrative arrangements which are consistent with applicable law and departmental policies in the interest of providing recreation management which will best serve the public interest efficiently and effectively. Whatever administrative arrangements are made, planning for recreation management will include consultation among Land Management, Reclamation, and the recreation interests mentioned above. Funding by Reclamation of recreation development and management will be limited to approved project plans.

(e) Fish and Wildlife Mitigation and Enhancement. Where Land Management lands have wildlife values related to wildlife values on Reclamation lands on authorized or constructed projects, consultations with Bureau of Sport Fisheries and Wildlife, State fish and game agencies, and other appropriate interests will include consideration of all the values involved, and all the alternatives for administrative arrangements which are consistent with applicable law and departmental policies in the interest of adequate protection and management of wildlife values. Whatever administrative arrangements are made, planning for management of wildlife values will include consultation among Land Management, Reclamation, and the wildlife interests mentioned above. Reclamation funding for fish and wildlife mitigation and enhancement will be limited to approved project development.

Section 6. Reservation of rights-of-way for Reclamation Projects.

In connection with facilities for Reclamation projects for which planning has or will have been accomplished under the provisions of Section 3 of this agreement, Reclamation will supply Land Management, as soon as practicable, with maps of location of the rights-of-way appropriated under Subsection P of the Act of December 5, 1924 (43 U.S.C. 417), together with any terms or conditions of use that have resulted from inter-Bureau consultations. In connection with other facilities, Reclamation will consult with Land Management in a manner to meet the objectives of Section 3 and thereafter Reclamation will supply the necessary maps and terms and conditions. Land Management will record the rights-of-way on its records.

Section 7. Coordination and Exchange of Services. Consistent with delegated authority, either Bureau may perform management services for the other, subject to the following specific arrangements:

A. Reclamation Homesteads and Reclamation Sales. Land Management State Directors, and Reclamation Regional Directors will coordinate their activities on Reclamation homesteads and sales cases for the most efficient conduct of the work and for application of Departmental land-use policies. Reclamation will conduct all field examinations, appraisals, and informal contacts with applicants and entrymen while Land Management will process the necessary documents.

B. Cadastral Surveys. Land Management will conduct, on a reimbursable basis, cadastral surveys, resurveys and investigations in accordance with Reclamation schedules, provided that Reclamation will notify Land Management of needs in sufficient time for it to incorporate the work into its authorized work programs and Reclamation provides the funds as required by that schedule. Notice at least six months before the fiscal year in which the work will be done will be sufficient time in all cases. However, when Reclamation finds it cannot give adequate advance notice with respect to relatively small amounts of work which it needs done in connection with its programmed work, Land Management will undertake the work nevertheless. Allocation of personnel ceilings will be consistent with Departmental policies. As soon as Reclamation identifies a need for such work, Reclamation will supply Land Management with a statement of the work it needs done. Land Management will promptly supply Reclamation with estimates of costs, manpower, time required, and other pertinent information. The Land Management State or Service Center Director and Reclamation Regional Director will make the necessary arrangements for incorporation of the work into Land Management programs.

C. Mining Claims.

(1) Where the construction of a Reclamation project requires the clearance of title to public lands encumbered by unpatented mining claims, Land Management will conduct, on a reimbursable basis, the examination of all unpatented mining claims, in accordance with Reclamation schedules, provided that Reclamation will notify Land Management of needs in sufficient time for it to incorporate the work into its authorized work program and Reclamation provides the funds as required by that schedule. Notice at least six months before the fiscal year in which the work will be done will be sufficient time in all cases. However, when Reclamation finds it cannot give adequate advance notice with respect to clearance of small areas, such as dam sites, Land Management will undertake the work nevertheless. Allocation of personnel ceilings will be consistent with Departmental policies. As soon as Reclamation identifies a need for such work, Reclamation will supply Land Management with a statement of the work it needs done, including necessary maps and other pertinent information. Land Management will promptly supply Reclamation with estimates of costs, manpower, and time required and other needed information. The Land Management State or Service Center Director and Reclamation Regional Director will make the necessary arrangements for incorporation of the work into Land Management programs. Promptly upon completion of its examinations and appraisals, Land Management will notify Reclamationof the results.

(2) With respect to claims determined by Land Management to be invalid, Land Management will, on a reimbursable basis, initiate as soon as possible adverse proceedings and will report to Reclamation on the initiation and results of adverse proceedings.

(3) Reimbursements will be made as agreed upon by the agencies' field officials.

D. ~~Land Disposals.~~ Land Management and Reclamation will consult with each other concerning their land disposal programs in the interest of consistency in the application of Departmental policies to the extent permitted by applicable law.

Section 8. Mitigation for Land Management Improvements on Reclamation Projects.

Land Management improvements and structures, including public land survey corner monuments, which will be destroyed or rendered useless by reason

of a Reclamation project and which are still needed by Land Management will be removed or replaced by Reclamation at a location to be determined by Land Management and such kind and quantity as will provide levels of service and/or access at least equivalent to those existing prior to the project construction, subject to interagency budgetary procedures.

Section 9. Protection of Resource Values During Reclamation Project Construction.

During project construction, Reclamation will take all reasonable precautions to prevent and suppress forest and range fires, soil erosion, stream pollution, and prevent any unnecessary damage to Land Management lands and resources in the area. To this end, Reclamation will consult with Land Management and will formulate fire prevention and control plans and programs and will provide for resource and environmental protection in location of access roads, and relocation of transportation facilities, land clearing and other construction matters.

Section 10. Withdrawal Review. Reclamation and Land Management will continue their cooperative program of review of Reclamation withdrawals in furtherance of the Withdrawal Review Program prescribed by DM 603.

Section 11. Land Transfers. Reclamation will determine, consistent with the land acquisition policy of the Secretary, the Land Management lands required for the construction, operation, and maintenance of Reclamation projects. Reclamation will request the Assistant Secretary for Water and Power to approve the filing of an application for withdrawal under the regulations in 43 CFR.2311.1. Reclamation, where possible, will file its request for withdrawal well in advance of its need for the land. Land Management will protect the public domain requested by Reclamation from further entry. If withdrawal has not been completed at the time public domain is needed by Reclamation for construction, Reclamation will request right of entry for construction and BLM will promptly process such request.

Section 12. Environmental Impact Analyses and Statements.

A. All actions taken pursuant to this agreement when related to environmental matters will conform with the requirements of Reclamation Instructions, Part 376, and Land Management Manual 1781 and 1782.

B. Where Land Management or Reclamation proposes an action in an area where both bureaus have responsibilities or interests, the two bureaus will cooperate in the preparation of environmental impact analyses and, where necessary or required under the National Environmental Policy Act of 1969, the lead bureau will prepare the environmental impact statement.

C. Unless otherwise provided by the Departmental Manual or other authority, Reclamation will have lead bureau responsibility, including the decision whether an environmental impact statement shall be prepared, where:

(1) Reclamation is considering a proposal to construct a reclamation project or unit thereof.

(2) Reclamation is considering, on authorized or constructed projects, the disposal of lands or interests in lands, including but not limited to easements, rights-of-way, leases and permits, as authorized by the Federal Reclamation laws.

(3) Reclamation requires a right-of-way across public lands for authorized project purposes.

(4) Any Reclamation action on other matters affecting lands or waters on authorized or constructed Federal Reclamation projects.

D. Unless otherwise provided by the Departmental Manual or other authority, Land Management will have lead bureau responsibility, including the decision whether an environmental impact statement shall be prepared, where:

(1) Land Management is considering a proposal to install or approve the installation of improvements or land treatments on Reclamation lands outside the boundaries of authorized or constructed Reclamation projects.

(2) Land Management is considering the issuance of a lease, license, or permit on Reclamation lands under the Mineral Leasing Act of 1920, the Materials Act, or the disposal of lands or non-mineral interests in such lands under the terms of this agreement.

(3) Land Management requires a right-of-way for its programs over reclamation lands located outside the boundaries of authorized or constructed reclamation projects.

Section 13. Transfer of Reclamation Project Obligations and Commitments.

Under the Reclamation Act of 1902, as amended, and under specific project authorizing documents Reclamation has certain obligations and commitments with respect to management of land resources. Reclamation will identify these land management obligations and their estimated costs in its project feasibility reports. Where Land Management assumes jurisdiction over Reclamation lands on an authorized or constructed project under this agreement, Reclamation will transfer funds to Land Management to cover Reclamation's obligation and commitments. Land Management will then accept the responsibility to pursue commitments of the work in its programming and budgeting procedures.

Section 14. Implementation. This agreement is effective upon approval by the Secretary of the Interior or his delegate. This agreement shall supersede all agreements heretofore existing between Reclamation and Land Management which are inconsistent with the purpose of this agreement. Agreements superseded include, but are not necessarily limited to, the following:

A. Agreement of April 29, 1941 - Memorandum of Understanding for Cooperation Between the Bureau of Reclamation and the Grazing Service, Department of the Interior, for Range Administration of Lands Withdrawn for Reclamation Purposes.

B. Memorandum of May 13, 1942 - Memorandum of Understanding Between the Bureau of Reclamation and Grazing Service, Department of the Interior.

C. Memorandum of February 28, 1945 - Memorandum of Agreement for Cooperation Between the Bureau of Reclamation and the General Land Office, Department of the Interior, for Range Administration of Lands Outside of the Exterior Boundaries of Grazing Districts and Forest Reserves and Withdrawn for Reclamation Purposes.

D. Memorandum of February 12, 1957 - Memorandum of Agreement Between the Bureau of Reclamation and the Bureau of Land Management for Services Rendered in Connection with Investigation of Mining Claims and Mineral Appraisals of Lands Within Bureau of Reclamation Projects.

E. Departmental Order No. 2533 of September 7, 1949, Sale of Timber on Lands Under the Jurisdiction of the Bureau of Reclamation.

Section 15 - Coordination Meetings. Representatives of Reclamation and Land Management will meet periodically, both in the field and in Washington, at the call of either agency, to review matters of mutual interest.

Section 16 - Renegotiation. This agreement and any supplemental agreements are renegotiable at the option of either party.

Approved:

Acting Commissioner, Bureau of Reclamation

Assistant Secretary, W&P

Director, Bureau of Land Management

Assistant Secretary, LM MAR 2 1972

Document No. 8-AA-54-07020

UNITED STATES

DEPARTMENT OF THE INTERIOR

BUREAU OF RECLAMATION

RIO GRANDE PROJECT - NEW MEXICO - TEXAS

SUPPLEMENTAL MEMORANDUM OF UNDERSTANDING

FOR ADMINISTRATION OF CERTAIN GRAZING LANDS

THIS SUPPLEMENTAL MEMORANDUM OF UNDERSTANDING (MOU), made and entered into this 16th day of November, 1987, by and between the Bureau of Reclamation, hereinafter styled "BR", Department of the Interior, represented by the officer executing this MOU, and the Bureau of Land Management, hereinafter styled "BLM", Department of the Interior, represented by the officer executing this MOU.

WITNESSETH:

WHEREAS, the BR and the BLM have heretofore entered into a MOU through delegation of authority from the Secretary of the Interior on March 25, 1983, providing for the basic principles for coordinating land use planning, land resource management, land conveyance and exchange, and cooperative services in the administration of acquired or withdrawn public lands for reclamation purposes; and

WHEREAS, pursuant to Section 6. L. of the MOU dated March 25, 1983, the BLM currently administers the grazing use and collects the fees on BR withdrawn and acquired lands of the Rio Grande Project (Project) and deposits said fees to a treasury account as directed by the BR; and

WHEREAS, it is now desired to define certain areas for grazing and update procedures for administration of grazing on Rio Grande Project (Project) lands; and

WHEREAS, the BLM does not receive adequate funding to cover the administrative cost of the grazing program associated with the Bureau of Reclamation's Project lands or for implementing rangeland improvements and maintenance on said lands; and

WHEREAS, the BR has full management jurisdiction on Project withdrawn or acquired lands except as provided for herein.

NOW THEREFORE, the parties hereto agree as follows:

1. The BLM will administer the lands as described in Schedule "A" and Schedule "B", attached hereto in accordance with the said MOU dated March 25, 1983, and in accordance with the stipulations contained in this Supplemental MOU. Lands to be administered by BLM for grazing are shown on Exhibit "A" for Caballo and Exhibit "B" for Elephant Butte.

2. The BLM shall be responsible for collecting revenues from grazing leases on Project lands and transferring appropriate funds into proper accounts according to Federal laws and regulations. A portion of these collected revenues shall be used by BLM for administration of grazing on Project lands and for construction and maintenance of improvements, including those requested by Bureau of Reclamation on Project lands.

3. The BLM will process applications to construct range improvements (i.e., fences, pipelines, corrals, etc.) and prepare National Environmental Policy Act documents to include cultural resource and endangered species clearances, and BR concurrence.

4. BLM will provide to BR copies of all authorizations granted on Project lands including but not limited to: range improvement permits, cooperative agreements, grazing billing notices, authorized allotments, and as-built drawings of existing range improvement sites.

5. The BR will notify and coordinate with BLM prior to implementing any proposed action; i.e., boundary adjustments, fence construction, or other range-land improvement projects that may affect grazing management on those lands described in Schedule "A" and Schedule "B".

6. Pursuant to paragraph 6. L. of said MOU of March 25, 1983, the BR will supply necessary stipulations to be attached to permits or licenses affecting said withdrawn and acquired lands.

7. The lands described in Schedule "A" and Schedule "B" are within the BR's multiple use management areas for the Project. Management agreements for various multiple uses of these same lands such as special use permits (utility, and road crossings, etc.), recreation, vegetation management, or fish and wildlife have been or may be entered into by the BR. If conflicts arise between the multiple uses of these lands, the BR, in consultation with the appropriate managing entities, will determine what action is necessary to resolve such conflicts.

8. Both parties hereto will have 30 working days from the date of receipt to review and respond to requests or proposed actions of the other.

IN WITNESS WHEREOF, the parties have executed this Supplemental MOU as of the date first hereinabove mentioned.

U.S. DEPARTMENT OF THE INTERIOR

Date: 9/28/87

By Larry V. Woodard

State Director, Bureau of Land Management, New Mexico State Office

Date: 11/16/87

By EUGENE HINDS

Regional Director, Southwest Region
Bureau of Reclamation

Schedule A

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

RIO GRANDE PROJECT, NEW MEXICO-TEXAS
CABALLO RESERVOIR SITE

LANDS TO BE ADMINISTERED BY BUREAU OF LAND MANAGEMENT

August 1987

(This list supercedes all previous lists)

Acquired Lands

Township 14 South, Range 4 West, New Mexico Principal Meridian

Sec. 7 - E½, Less Lot 5
E½W½
W½NW¼ East of Highway
NW¼SW¼ East of Highway
Sec. 8 - W½SW¼
Sec. 17 - W½E½, W½
Sec. 18 - E½, E½W½
W½NW¼ East of Highway
NW¼SW¼ East of Highway
Sec. 19 - E½, E½NW¼, NE¼SW¼
SE¼SW¼ East of Highway
Sec. 20 - W½E½, E½SW¼, SW¼SW¼
Sec. 29 - W½E½, W½
Sec. 30 - N½NE¼, East 940' of NE¼NW¼
Parts of S½NE¼ and SE¼
Sec. 31 - E½NE¼, NW¼NE¼, SE¼
Sec. 32 - NW¼NE¼, NE¼NW¼, W½W½

Township 15 South, Range 4 West, New Mexico Principal Meridian

Sec. 5 - W½NE¼, W½, SE¼
Sec. 6 - E½, SE¼NW¼, E½SW¼
Sec. 7 - All
Sec. 8 - All
Sec. 17 - W½NE¼, NE¼NW¼, W½W½, NE¼SW¼, NW¼SE¼
Sec. 18 - All
Sec. 19 - E½, NW¼, E½SW¼, SW¼SW¼
Sec. 20 - W½NW¼, SE¼NW¼, SW¼
Sec. 29 - W½NW¼, SE¼NW¼, NW¼SW¼
Sec. 30 - All
Sec. 31 - W½E½, W½

## CABALLO RESERVOIR

### Acquired Lands

Township 16 South, Range 4 West, New Mexico Principal Meridian

Sec. 6 - NW¼NE¼ or Lots 2 and 7
W½, SW¼SE¼
Sec. 7 - W½NE¼, W½, NW¼SE¼
Sec. 18 - W½W½, SE¼SE¼SW¼, S½SW¼SE¼
Sec. 19 - W½NE¼, N½SE¼, NW¼
Sec. 30 - SE¼SW¼

Township 15 South, Range 5 West, New Mexico Principal Meridian

Sec. 12 - SE¼SE¼
Sec. 13 - NE¼NE¼
Sec. 25 - SE¼NE¼
SW¼NE¼ East of Highway
E½SW¼ East of Highway
SE¼
Sec. 36 - SE¼NE¼

Township 16 South, Range 5 West, New Mexico Principal Meridian

Sec. 1 - E½E½, SE¼SW¼, SW¼SE¼
Sec. 12 - E½, N½NW¼ (East of Highway)
Sec. 13 - NW¼
Sec. 23 - E½SW¼, N½SE¼, SE¼SE¼
Sec. 24 - SW¼SW¼
Sec. 25 - N½NW¼, SW¼NW¼
Sec. 26 - NE¼NE¼

---

### Public Withdrawn Lands

Township 14 South, Range 4 West, New Mexico Principal Merdian

Sec. 4 - SW¼SW¼ (Lot 12)
Sec. 5 - Lots 5 and 6 (Part S½SE¼)
Sec. 7 - SW¼SW¼
Lot 5 (In SW¼SE¼)
Sec. 8 - N½NW¼, SE¼SW¼
Sec. 17 - E½SE¼
Sec. 18 - SW¼SW¼
Sec. 19 - W½NW¼, NW¼SW¼
Sec. 20 - E½E½, NW¼, NW¼SW¼
Sec. 29 - E½NE¼, NE¼SE¼
Sec. 31 - SW¼NE¼
Sec. 32 - SE¼NW¼, E½SW¼

Township 15 South, Range 4 West, New Mexico Principal Meridian

Sec. 4 - SW¼SW¼
Sec. 5 - SE¼NE¼

CABALLO RESERVOIR SITE

Public Withdrawn Lands

Township 15 South, Range 4 West, New Mexico Principal Meridian (Cont'd.)

Sec. 6 - NE¼NW¼, W½SW¼
Sec. 9 - NW¼NW¼
Sec. 17 - NE¼NE¼, SE¼NW¼, SE¼SW¼, SW¼SE¼
Sec. 19 - NW¼SW¼
Sec. 20 - W½NE¼, NE¼NW¼
Sec. 29 - NE¼NW¼, NE¼SW¼

Township 16 South, Range 4 West, New Mexico Principal Meridian

Sec. 6 - E½E½, SW¼NE¼, NW¼SE¼
Sec. 7 - E½E½, SW¼SE¼
Sec. 18 - W½NE¼, E½NW¼, NE¼SW¼, W½SE¼SW¼, NE¼SE¼SW¼, NW¼SE¼, N½SW¼SE¼
Sec. 19 - S½NW¼NE¼, SW¼NE¼, NE¼SE¼

Township 15 South, Range 5 West, New Mexico Principal Meridian

Sec. 12 - NE¼SE¼
Sec. 25 - NE¼NE¼
Sec. 36 - N½NE¼, SW¼NE¼, NW¼, SE¼

Township 16 South, Range 5 West, New Mexico Principal Meridian

Sec. 1 - W½NE¼, N½SW¼, SW¼SW¼, NW¼SE¼
Sec. 12 - S½NW¼, SW¼
Sec. 13 - NE¼
Sec. 23 - SW¼SE¼
Sec. 24 - NW¼SW¼
Sec. 25 - NE¼

Schedule B

# LIST OF LANDS IN ELEPHANT BUTTE RESERVOIR TO ACCOMPANY MEMORANDUM OF UNDERSTANDING BETWEEN BUREAU OF RECLAMATION AND BUREAU OF LAND MANAGEMENT FOR ADMINISTRATION OF GRAZING PRIVILEGES

Dated August 10, 1987

| Township | Range | Section | Subdivision or fractions thereof |
|---|---|---|---|
| 8 S | 2 W. | 20 | E½ E½ |
| | | 21 | W½W½ |
| | | 29 | All |
| | | 30 | NE¼ NE¼: S½ NE¼ SE¼; S½ SW¼ |
| | | 31 | All |
| | | 32 | W½ |
| 9 S | 2 W. | 6 | All |
| 9 S | 3 W. | 1 | E½; E½ SW¼; SW¼ SW¼ |
| | | 11 | SE¼ NE¼ E½ SE¼ |
| | | 12 | W½ NW¼ |
| | | 13 | All |
| | | 14 | E½ E½; SW¼ SE¼ |
| | | 23 | E½; SE¼ NW¼ E½ SW¼; SW¼ SW¼ |
| | | 24 | W½ |
| | | 25 | W½ W½ |
| | | 26 | All |
| | | 27 | SE¼ NE¼; SE¼ |
| | | 33 | S½ NE¼; SE¼ SE¼ SW¼ |
| | | 34 | All |
| | | 35 | W½; NE¼ |
| 10 S | 3 W. | 3 | All |
| | | 4 | All |
| | | 5 | SE¼ NE¼; E½ SE¼ |
| | | 8 | E½ E½ |
| | | 9 | All |
| | | 15 | W½ W½ |
| | | 16 | All |
| | | 17 | E½; S½ SW¼ |
| | | 19 | SE¼ NE¼; E½ SE¼ |
| | | 20 | All |
| | | 21 | N½; N½ S½; S½ SW¼ |
| | | 22 | W½ W½ |
| | | 28 | W½ |
| | | 29 | All |
| | | 30 | E½ E½; SW¼ SE¼ |
| | | 31 | NE¼ |
| | | 32 | N½; SE¼; E½ SW¼ |

| Township | Range | Section | Subdivision or fractions thereof |
|---|---|---|---|
| | | 33 | NW¼; N½ SW¼; SW¼ SW¼ |
| 11 S. | 3 W | 4 | W½ W½ |
| | | 5 | E½; E½ W½ |
| | | 7 | E½; E½, W½ |
| | | 8 | N½; SW¼; W½ SE¼ |
| | | 9 | W½ NW¼ |
| | | 17 | W½ E½; W½ |
| | | 18 | E½; SW¼; E½ NW¼ |
| | | 19 | All |
| | | 20 | W½; W½ E½; E½ SE¼ |
| | | 21 | SW¼ |
| | | 28 | W½ |
| | | 29 | All |
| | | 30 | All |
| | | 31 | All |
| | | 32 | All |
| | | 33 | All |
| | | 34 | W½ W½ |
| 11 S. | 4 W | 13 | S½ SE¼ |
| | | 24 | E½; E½ SW¼ |
| | | 25 | E½; E½ W½ |
| | | 35 | E½ SE¼; |
| | | 36 | E½; E½ W½; W½ SW¼ |
| 12 S. | 3 W | 3 | W½ W½ |
| | | 4 | All |
| | | 5 | All |
| | | 6 | All |
| 12 S. | 3 W | 7 | All |
| | | 8 | All |
| | | 9 | All |
| | | 10 | W½ W½ |
| | | 15 | W½ NW¼ |
| | | 16 | N½ |
| | | 17 | N½ |
| | | 18 | N½ |
| 12 S. | 4 W | 1 | E½; NW¼ |
| | | 2 | NE¼ NE¼ |
| | | 12 | NE¼ NE¼ |

The above described land includes all of the public land now reserved under Reclamation Withdrawal for Elephant Butte Reservoir purposes and some of the land acquired from private owners for the same purpose, being that portion of the reservoir reserve bordering on Public Domain Land on which the Bureau of Land Management has issued or may issue grazing permits. The attached map shows in red that portion of the above described land which lies above the reservoir high water flow line at spillway crest elevation. The area below the high water flow line is subject to grazing where exposed or not inundated depending on the stage of the Reservoir or the elevation of the reservoir water surface.

OTHER ACQUIRED LANDS -- ELEPHANT BUTTE RESERVOIR

| Township | Range | Section | Subdivision or fractions thereof |
|---|---|---|---|
| 8S | 2W | 21 | E1/2 W1/2, E1/2 west of Grant |
| | | 22 | W1/2 W1/2 west of Grant |
| | | 28 | Parts of NW1/4, NE1/4, SW1/4 west of Grant |
| | | 32 | E1/2 west of Grant |
| 9S | 2W | 5 | W1/2, E1/2 west of Grant |
| | | 7 | All |
| | | 8 | W1/2, W1/2 E1/2 west of Grant |
| | | 17 | NW1/4 west of Grant |
| | | 18 | N1/2, N1/2 S1/2 north of Grant |
| | | 19 | NW1/4 west of Grant |
| 9S | 3W | 12 | E1/2 , SW1/4, E1/2 NW1/4 |
| | | 24 | E1/2 west of Grant |
| | | 25 | E1/2, NW1/4 west of Grant |
| | | 35 | SW1/4 west of Grant |
| | | 36 | NW1/4 west of Grant |
| 10S | 3W | 2 | Parts of NW1/4 and NW1/4 SW1/4 west of Grant |
| | | 10 | W1/2 west of Grant |
| | | 15 | Parts of NW1/4, NW1/4 SW1/4 west of Grant |
| | | 29 | All |
| | | 32 | NE1/4 |
| 12S | 3W | 4 | All |
| | | 6 | S1/2, portion of N1/2 |
| | | 9 | All |
| | | 18 | portion of S1/2 |

Department of the Interior
Bureau of Reclamation
Rio Grande Project - New Mexico-Texas

Index

FISH AND WILDLIFE SERVICE


| Date | Contract | Tab |
|---|---|---|
| Sept. 1, 1937 | Secretary of Interior, and Secretary of Commerce<br>Respecting the Construction and Subsequent O&M of a Fish Hatchery below Elephant Butte Dam, New Mexico | 1 |
| Dec. 26, 1940 | Bureau of Reclamation, and Fish and Wildlife Service<br>Transfer of Fish Hatchery improvements to be operated and maintened by the Fish and Wildlife Service | 2 |
| Apr. 5, 1949 approving Memorandum dated 2-7-49 | Bureau of Reclamation, and Fish and Wildlife Service<br>Water Supply Line | 3 |
| Aug. 29, 1952 | Bureau of Reclamation, and Fish and Wildlife Service<br>Rental of cabin and garage | 4 |
| Dec. 16, 1960 | Memo of Agreement for emergency repairs by Elephant Butte personnel on Fish Hatchery electrical facilities. | 5 |

DEPARTMENT OF THE INTERIOR

BUREAU OF RECLAMATION

RIO GRANDE IRRIGATION PROJECT

MEMORANDUM OF AGREEMENT

between

THE SECRETARY OF THE INTERIOR

and the

SECRETARY OF COMMERCE

Dated

September 1, 1937

Respecting the Construction and Subsequent Operation and Maintenance of a Fish Hatchery below Elephant Butte Dam, New Mexico.

Memorandum of agreement between the Secretary of the Interior and the Secretary of Commerce respecting the construction and subsequent operation and maintenance of a fish hatchery below Elephant Butte Dam in New Mexico.

* * * * * * *

To the end that a fish hatchery may be constructed and subsequently operated and maintained below the Elephant Butte Dam in New Mexico on the Rio Grande Federal Reclamation Project, the Secretary of the Interior and the Secretary of Commerce have agreed on the following principles to govern their respective services during the construction and subsequent operation and maintenance of the fish hatchery:

1. The Bureau of Reclamation of the Department of Interior will provide a site for the fish hatchery [illegible] to the Bureau of Fisheries of the Department of Commerce on lands lying below the Elephant Butte Dam in New Mexico which were purchased by the Federal Government for Reclamation purposes and as shown on Exhibits A and B which are attached hereto and which are hereby made a part of this agreement. The fish hatchery site, as shown on these exhibits, has a length of approximately 3000 feet, beginning at a point approximately 300 feet below Elephant Butte Dam and varying in width from 200 to 300 feet.

2. The Bureau of Reclamation will arrange for the construction of the fish hatchery utilizing for this purpose the supplies and personnel of one or more CCC camps located at Elephant Butte Dam. Construction of the fish hatchery by the Bureau of Reclamation

will be limited to that accomplished by CCC forces and to the features shown on Exhibit B hereof, and will not include cultural equipment. Construction of these features will be in accordance with detailed plans and specifications to be prepared by either the Bureau of Reclamation or the Bureau of Fisheries as may be mutually agreed upon, and all plans and specifications so prepared will be approved by designated representatives of each Bureau prior to actual construction of the features detailed therein. The Bureau of Fisheries will assign or arrange to transfer to the Bureau of Reclamation for the duration of the construction period, a qualified employee to supervise and inspect the construction of the fish hatchery.

3. Upon completion of the fish hatchery by the CCC forces under the general direction of the Bureau of Reclamation it will be turned over to the Bureau of Fisheries for permanent operation and maintenance without further cost to the Bureau of Reclamation. On acceptance the Bureau of Fisheries will install the necessary cultural equipment and assign sufficient employees to properly maintain and operate the hatchery on a permanent basis.

4. Electrical energy and the necessary water required for the permanent operation of the fish hatchery will be furnished the Bureau of Fisheries without cost, this cost to be borne by the Elephant Butte Irrigation District and the El Paso County Improvement District Number One as part of their operation and maintenance cost of the Rio Grande Reclamation Project, and appropriate resolutions, passed by these districts on August 18,

1936 and September 1, 1936, respectively, authorizing this arrangement, are attached hereto and the terms thereof are made a part of this agreement, as Exhibits C and D respectively.

5. Operation of the hatchery as it may affect the operations of the Bureau of Reclamation or as operations of the Bureau of Reclamation may affect the operation of the fish hatchery will be subject to such working arrangements as from time to time may be mutually agreed upon by the Bureau of Fisheries and Bureau of Reclamation.

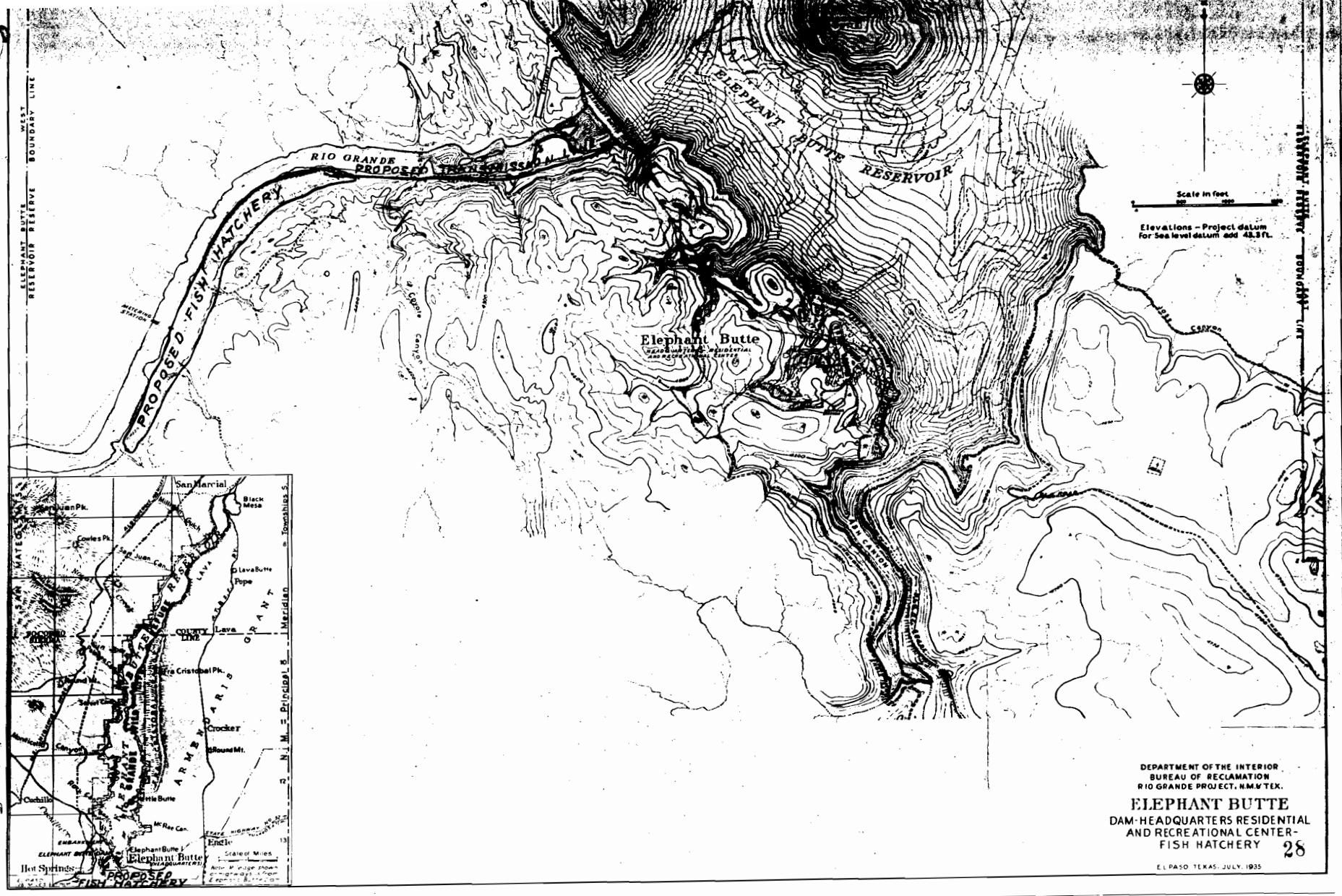
6. Distribution of fish reared in the fish hatchery will be confined to stocking the Elephant Butte Reservoir and the Caballo Reservoir and the ditches of the Rio Grande Reclamation Project, including that portion of the Rio Grande within the project, as determined by the designated representative of the Bureau of Fisheries in cooperation with the designated representative of the Bureau of Reclamation.

7. Elephant Butte Reservoir, having been designated by Executive Order as the Rio Grande Wild Life Refuge, operations under this agreement will be carried on in a manner compatible with the memorandum of agreement executed under date of December 19, 1935, between the Secretary of the Interior and the Secretary of Agriculture pertaining to administration of reclamation projects which are also bird and wildlife reservations and refuges.

Charles West
Secretary of the Interior

9-1-37
Date

Secretary of Commerce



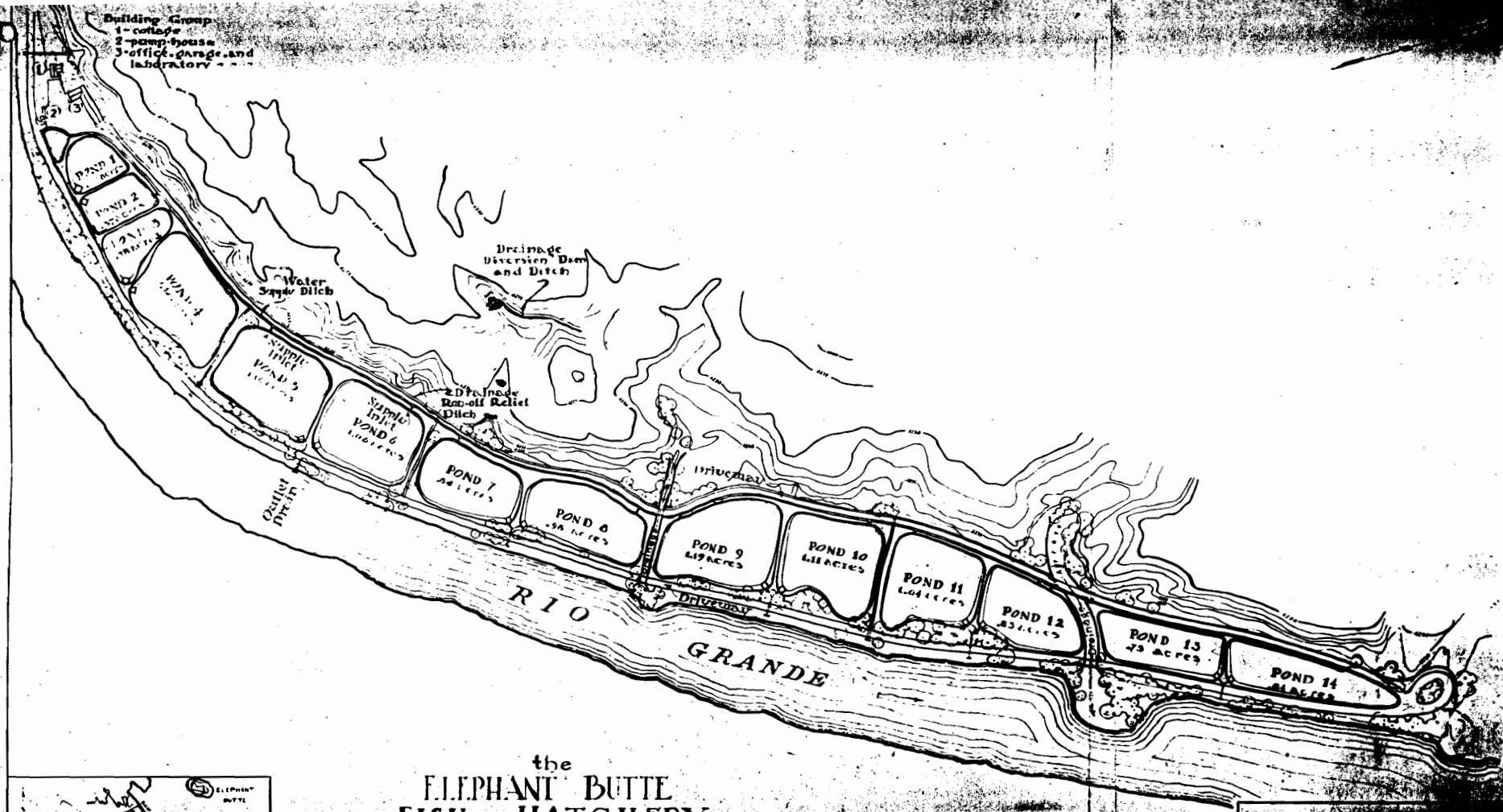

DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
RIO GRANDE PROJECT, N.M. & TEX.

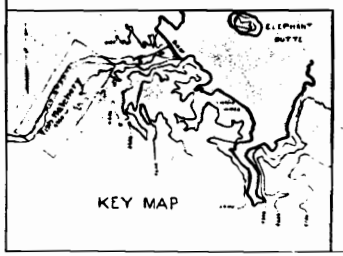
# ELEPHANT BUTTE

DAM-HEADQUARTERS RESIDENTIAL AND RECREATIONAL CENTER-FISH HATCHERY

28

EL PASO, TEXAS, JULY, 1935




# the ELEPHANT BUTTE FISH HATCHERY at ELEPHANT BUTTE NEW MEXICO

Scale in Feet

0 100 200 300 400 500

DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
RIO GRANDE PROJECT, NEW MEXICO

**ELEPHANT BUTTE FISH HATCHERY**

GENERAL PLAN

SCALE 1 INCH 100 FEET

COPY

CONCERNING THE PROPOSED CONSTRUCTION OF A FISH HATCHERY AT ELEPHANT BUTTE.

On motion of Mr. Case, seconded by Mr. Lewis, put to a vote and carried, the following resolution was entered:

Be it Resolved by the Board of Directors of Elephant Butte Irrigation District, [illegible] the views of this Board that the construction of a fish hatchery at Elephant Butte Dam, New Mexico, would be a worthwhile and constructive objective and that the District should and it hereby does approve the establishment of such a fish hatchery provided that it could be accomplished without cost to the District for the construction thereof and without detriment to or interruption of the expeditious accomplishment to completion of the program of betterment and development work upon which there is now engaged at Elephant Butte a Civilian Conservation Corps camp and for which program such camp was established and provided further that it shall be operated by the Bureau of Fisheries of the Department of Commerce.

Be It Further Resolved that in the event of such construction, establishment and operation of such fish hatchery in the manner aforesaid, the District hereby agrees that without charge to the United States or its Bureau of Fisheries there shall be furnished from any plant or plants which may now or hereafter be operated at Elephant Butte for supplying electrical energy for the Rio Grande Project or for commercial purposes, and during such time as such plant or plants may be in operation for the generation of electrical energy for [illegible]

it being contemplated that any cost incident to making available such water and electrical energy shall constitute and become a part of the cost of operation and maintenance of the Rio Grande Project.

Be it further resolved that said fish hatchery shall be constructed according to the plans and specifications submitted to the Project Superintendent and the use of water and electricity shall not exceed the amounts required to operate the hatchery in accordance with plans and specifications approved by the Bureau of Reclamation. Be it further resolved that the obligations to make water and electricity available by the Rio Grande Project, shall not include the digging and equipment of any well or wells or the construction of any pipe lines or canals or the construction of any power lines.

(Sd) A. S. Robertson
President

SEAL

Attest: JOSE R. LUCERO
Secretary

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COPY

After further discussion concerning the establishment of a fish hatchery at Elephant Butte by the Bureau of Fisheries of the [redacted], on motion of Mr. Gibbs, seconded by Mr. [redacted] and carried, the following resolution was adopted:

BE IT RESOLVED by the Board of Directors of El Paso County Water Improvement District Number One that it is the sense of this Board that the construction and establishment of a fish hatchery at Elephant Butte, New Mexico, is desirable and that the District approves the establishment of such fish hatchery, provided that it be accomplished without cost to the District for the construction and operation thereof, and without detriment to or the interruption of the program of betterment and development work now engaged in at Elephant Butte by the Civilian Conservation Corps camp.

BE IT FURTHER RESOLVED that in the event of such construction, establishment and operation of such fish hatchery in the manner aforesaid, the District hereby approves the furnishing, without charge, [redacted] of the establishment, to the extent [redacted] of the El Paso Project.

El Paso, Texas, 1/20-35-35

I DO HEREBY CERTIFY, that the foregoing is a true and correct transcript of the record of a motion duly passed by the Board of Directors of the El Paso County Water Improvement District No. 1 at a regular meeting held at El Paso, Texas, on [redacted], 1935, and as the same appears in the official files of said District, in my custody.

(Sgd.) [redacted]
Secretary

(SEAL)
(Notation in duplicate)

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UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
Washington

September 4, 1937

AIRMAIL

From Acting Commissioner

To Regional Director, El Paso, Texas

Subject: Inter-departmental fish hatchery at Elephant Butte - Rio Grande Project.

1. Reference is made to the Commissioner's memorandum of July 23, 1937, to the Secretary of the Interior, forwarding a proposed memorandum of agreement between the Secretary of the Interior and the Secretary of Commerce respecting the construction and subsequent operation and maintenance of a fish hatchery below Elephant Butte Dam, copy of which was sent you, and to previous correspondence.

2. This is to advise you that on Septe[illegible] 1937, this [illegible] Secretary of Commerce, and having been previously signe[illegible] by Charles West, Acting Secretary of the Interior, is now approved by both departments.

3. With the approvals of both departments, construction work may be started at any time, but estimates and authorities should be submitted covering such work as soon as possible.

R. B. Williams

cc-Regional Director, El Paso,
Texas, by regular mail
cc-Chief Engineer
cc-District Counsel, El Paso,
Texas.

DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
RIO GRANDE PROJECT
NEW MEXICO-TEXAS

# MEMORANDUM OF TRANSFER

Dated December 26, 1940

Between

Commissioner - Bureau of Reclamation

and

Director - Fish and Wildlife Service

Transfer of Fish Hatchery improvements to be Operated and Maintained by the Fish and Wildlife Service.

MEMORANDUM OF TRANSFER OF IMPROVEMENTS TO BE OPERATED AND MAINTAINED BY THE FISH AND WILDLIFE SERVICE ELEPHANT BUTTE DAM, NEW MEXICO

WHEREAS, under date of September 1, 1937, there was executed a memorandum of agreement between the Secretary of the Interior, and the Secretary of Commerce, respecting the construction and subsequent operation and maintenance of a fish hatchery below Elephant Butte Dam in New Mexico; and

WHEREAS, Article 3 of said memorandum agreement provides as follows:

"Upon completion of the Fish Hatchery by the CCC forces under the general direction of the Bureau of Reclamation it will be turned over to the Bureau of Fisheries for permanent operation and maintenance without further cost to the Bureau of Reclamation. On acceptance the Bureau of Fisheries will install [illegible] equipment and assign sufficient [illegible] on a permanent basis; and

WHEREAS, said Fish Hatchery has now been completed to the extent contemplated by the parties to said memorandum agreement; and

WHEREAS, the successor in interest of the Bureau of Fisheries is the Fish and Wildlife Service:

NOW, THEREFORE, in pursuance of the foregoing, the Bureau of Reclamation hereby transfers to the Fish and Wildlife Service, both of the Department of Interior, for listing on the property returns of, and for the operation and maintenance by said Fish and Wildlife Service the following described property:

(a) Location

All facilities and improvements as enumerated below, located on a parcel of land as shown generally on the plat, attached hereto, made a part hereof marked Exhibit A, hereinafter called the "hatchery area", being situated on a bench lying along the east bank of the Rio Grande for a distance of approximately 4800 feet commencing on the south side of Coyote Canyon approximately 8800 feet downstream from Elephant Butte Dam and extending from the river bank to the hillside above the operating road.

(b) Area

| | | |
|---|---|---|
| Water surface area in ponds | 12.2 | acres |
| Land Area outside of ponds | 11.3 | " |
| Total | 23.5 | " |

(c) Ponds

| | | |
|---|---|---|
| Pump discharge pool | 0.62 | Acres Water Surface Area |
| Rearing Pond #1 | 0.39 | " " " " |
| " " #2 | 0.43 | " " " " |
| " " #3 | 0.60 | " " " " |
| " " #4 | 1.20 | " " " " |
| " " #5 | 1.21 | " " " " |
| " " #6 | 1.96 | " " " " |
| " " #7 | 1.61 | " " " " |
| " " #8 | 0.87 | " " " " |
| " " #9 | 0.96 | " " " " |
| " " #10 | 1.15 | " " " " |
| " " #11 | 0.88 | " " " " |
| " " #12 | 0.88 | " " " " |
| Total | 12.25 | |

(d) Building Group

Residence - One six-room residence with stone masonry exterior walls, lath and plaster stud partitions, hard wood floor, pitch, felt and gravel flat roof, stucco exterior, plastered interior, containing living room, dining room, kitchen, 3 bedrooms, bath, partial basement, two porches and one open terrace. Structure complete with water, sewer and electric supply. Exterior dimensions approximately 44' x 48'.

Service Building - One combination building providing: office, assistant's quarters with bath, 2-stall truck garage (21' x 29'), store room and fish food room; stone masonry walls on exterior and between garage space and other parts of the building, concrete floors, pitch, felt and gravel flat roof, stuccoed exterior, plastered interior (except

stone walls in garage space), structure complete with water, sewer, and electric supply. Approximate exterior dimensions 26' x 34'.

Pump House - A combination structure providing pump house including sump, work shop and one-car garage; concrete walls, concrete floor, composition flat roof, stucco exterior, electric supply. Installation provided in this building includes one Peerless sump pump with capacity of 600 g.p.m. operated by 5 h.p. motor, complete with automatic switch control, electric connection and discharge pipe connections and valves, for supplying water to the ponds, also two 10 KVA electric transformers. Approximate exterior dimensions 14' x 32'.

Holding Shed - A building with open sides, concrete floor; wood frame gable roof, composition covered; contains eight concrete tanks; complete water and electric supply. Approximate exterior dimensions 18' x 44'.

(e) Appurtenant Works

Roads

Park Roads - 0.84 mile 18' wide
Service Roads - 0.50 mile 16' wide

[redacted]

slab covered, size 24" wide by 24" deep.
500 linnal feet 4" pipe feed lines.

Structures

Pond inlets 12 concrete discharge pools with metal outlet gates, 8" sewer tile drain discharge pipe.
Road culverts 8 rock masonry 18' to 30' long, 4' to 8' span
Road culverts 3 metal pipe - 30" x 24', 30" x 28', 24" x 24'

Drainage

6 areas drainage ditches, rock masonry lined, 1200 lin.ft. total length, width 3'6" to 8', depth 3' to 4'
Diversion ditches and roadside ditches where necessary, length not determined.
Curbs, walls and miscellaneous structures where necessary.

Sewage Disposal

280 lin. ft. of 4" sanitary sewer running to a 6' x 10' cesspool.

(f) Power Line

3150 lin. ft. of 2300 volt, 3 phase electric power line from Elephant Butte Dam power plant to the pump house.

(g) Landscaping

Grading, terracing, curbs and walls as seemed desirable, and the planting of an undetermined number of trees and shrubs.

The Fish and Wildlife Service hereby accepts such transfer as full compliance by the Bureau of Reclamation of its undertaking under the inter-departmental memorandum agreement of September [illegible] and will operate and maintain the same in accordance with [illegible] for use of the Fish and Wildlife Service.

Nothing herein shall be construed as having the effect of severing the hatchery area from the Elephant Butte Reclamation reservation and said hatchery area shall remain and continue to be a part of said Reclamation reserve and available for all reasonable uses incident to said Reclamation project not incompatible with the reasonable use of said area as a fish hatchery. The Bureau of Reclamation shall be afforded over and across the said hatchery area access to all points on the Rio Grande, including the uninterrupted access to and use of roads situated thereon.

IN WITNESS WHEREOF, the parties hereto have hereunto set their hands this 26th day of December, 1940.

JOHN C. PAGE
Commissioner
Bureau of Reclamation

IRA N. GABRIELSON 12/26/40
Director,
Fish and Wildlife Service

Approved: Feb. 8, 1941

E. K. BURLEW
First Assistant Secretary of the Interior.

In reply refer to
L4- New Mexico
Hot Springs FCS

February 7, 1949

Memorandum

To: Commissioner, Bureau of Reclamation.

From: Acting Director, Fish and Wildlife Service

Subject: Memorandum of Understanding - Water Supply Line-Elephant Butte Dam.

Under date of September 1, 1937, there was executed a memorandum of agreement between the Secretary of the Interior and the Secretary of Commerce respecting the construction and subsequent operation and maintenance by the Bureau of Fisheries of a fish hatchery below Elephant Butte Dam in New Mexico. The hatchery was completed to the extent contemplated by the parties to the said memorandum agreement.

Pursuant to the said agreement, there was [illegible]

[illegible] the Bureau of Reclamation and the Director of the Fish and Wildlife Service, the successor in interest of the former Bureau of Fisheries, transferring to the Fish and Wildlife Service for listing on the property returns of, and for the operation and maintenance by this Service all facilities and improvements located on the hatchery area.

The existing pumping system for supplying water for the operation of the hatchery is not satisfactory and it is proposed to construct a water supply pipe line from Elephant Butte Dam to the hatchery as shown on the plan drawing titled "Proposed Water Supply Line" attached to and made a part of this memorandum. The proposed line will result in more efficient operation of the station and in the long run will be less expensive than the present pumping system. The construction, operation, and maintenance of the pipe line will be at the expense of the Fish and Wildlife Service and will be subject to supervision by the Bureau of Reclamation.

If the proposed construction meets with your approval it is suggested that this memorandum be considered as authorization for the proposed installation subject to the terms of the said agreement of September 1, 1937, and as an amendment to the memorandum of transfer dated December 26, 1940, referred to above.

If you concur in this recommendation please indicate your approval by executing all copies of this memorandum, and return the original to this Service.

SGD M. C. James
Acting Director

Approved:

Commissioner, Bureau of Reclamation

Date:

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
Washington 25, D. C.

APR 5 1949

Memorandum

To: Director, Fish and Wildlife Service

From: Commissioner

Subject: Memorandum of Understanding - Water Supply Line, Elephant Butte Dam.

I have approved and am returning herewith the original copy of Acting Director James' memorandum of February 7, which authorized the Fish and Wildlife Service to proceed with the installation of a water supply line from Elephant Butte Reservoir to the fish hatchery below the Elephant Butte Dam.

(Sgd.) M.W.S.

Enclosure 978

CC-Reg.Dir.,Amarillo,Tex. (w/copy of encl.)
-Proj.Mgr.,El Paso,Tex. (w/out copy of encl.)

MEMORANDUM OF UNDERSTANDING

**Between the**

BUREAU OF RECLAMATION

**and the**

**FISH AND WILDLIFE SERVICE**

**Dated August 29, 1952**

**Rental of cabin and garage**

MEMORANDUM OF UNDERSTANDING

Between the

BUREAU OF RECLAMATION

and the

FISH AND WILDLIFE SERVICE

1. This Memorandum of Understanding entered into the 29th day of August, 1952, between the Bureau of Reclamation, hereinafter styled the Bureau, represented by the Project Manager, El Paso, Texas, and the Fish and Wildlife Service, represented by its Regional Director, Albuquerque, New Mexico,

WITNESSETH THAT:

2. WHEREAS, the Rio Grande National Wildlife Refuge as established by Executive Order No. 6086 dated March 26, 1933, has been revoked by Public Land Order No. 378 dated July 1, 1947, effective at 10:00 a.m., September 2, 1947; and

3. WHEREAS, the Fish and Wildlife Service continues to operate the Elephant Butte Fish Hatchery, and continues to occupy and use [illegible] Fish and Wildlife Service on the Elephant Butte Reservoir; and

4. WHEREAS, during the period the Rio Grande National Wildlife Refuge included the Elephant Butte lake area, the Fish and Wildlife Service maintained a one-room cabin with garage attached as hereinafter described; and

5. WHEREAS, the Fish and Wildlife Service desires to maintain for official purposes in connection with the operation of the Elephant Butte Fish Hatchery, and enforcement duties, the said one-room cabin with garage attached, and

6. WHEREAS, the Memorandum of Understanding between the Bureau and the Fish and Wildlife Service dated September 2, 1947, expires September 1, 1952,

It is, therefore, agreed as follows:

7. The Bureau hereby consents to the continued maintenance of the one-room cabin with garage attached, masonry construction, by the

7. (continued) Fish and Wildlife Service which is located on a point in the SW¼NE¼ of Section 5, T. 11 S., R. 3 W.

8. The Fish and Wildlife Service recognizes the right of the Bureau to have access over or across the premises adjacent to the said cabin and that the area is a part of the Elephant Butte Reservation under the supervision of the Bureau.

9. This agreement shall terminate September 1, 1962, unless sooner terminated in accordance with Article 10 hereof.

10. Either party hereto may terminate this Memorandum of Understanding on 30-days' written notice to the other. Upon such termination, the Fish and Wildlife Service shall have the right within reasonable time thereafter to remove all of its property from the premises which can be removed without damage to the premises.

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

By /s/ W. F. Resch
Project Manager

UNITED STATES DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE

By /s/ John C. Gatlin
Regional Director

9/16/52

W7R

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
RIO GRANDE PROJECT - NEW MEXICO-TEXAS

THIS SUPPLEMENTAL AGREEMENT, made this 16th day of December, 1960, in pursuance of the Act of June 17, 1902 (32 Stat. 388) and acts amendatory thereof or supplementary thereto, and Section 601 of the Economy Act of June 30, 1932, between the BUREAU OF RECLAMATION, hereinafter styled Reclamation, represented by the officer executing this agreement and the BUREAU OF SPORT FISHERIES AND WILDLIFE, hereinafter styled Fisheries, represented by the officer executing this agreement.

WITNESSETH THAT:

WHEREAS, the Fisheries, which operates a fish hatchery within the Elephant Butte Dam reservation, requires skilled electrical personnel from time to time for emergency repair and maintenance of its electrical facilities used in the operation of the fish hatchery, and such personnel are not available in the nearby area, including the City of Truth or Consequences, New Mexico; and

WHEREAS, skilled electrical personnel are employed by the Reclamation at Elephant Butte and could be made available, when not urgently needed, to perform emergency repair and maintenance work for the Fisheries;

NOW, THEREFORE, the parties hereto agree as follows:

1. To the extent that they are not otherwise required for assigned duties, Reclamation skilled electrical personnel will be made available, at the request of proper Fisheries' authorities, to perform emergency repairs and maintenance on the electrical facilities owned and operated by the Fisheries at the Elephant Butte fish hatchery.

2. Whenever such work is performed by Reclamation personnel for the Fisheries, the Fisheries hereby agrees to reimburse the Reclamation, upon billing, for all labor, material and related costs thus entailed, plus 25% to cover administrative and earned leave expenses.

3. It is understood by both parties hereto that the requirements of the Rio Grande Project have a primary demand upon the services of the Reclamation electrical personnel, and that the use of such personnel to assist the Fisheries must not interfere with these requirements.

4. This agreement may be terminated by either party upon thirty (30) days written notice to the other.

IN WITNESS WHEREOF, the parties hereto have executed this agreement as of the day and year first above written.

BUREAU OF RECLAMATION

By /s/ W. F. Resch
W. F. Resch, Project Manager
211 U. S. Court House
El Paso, Texas

BUREAU OF SPORT FISHERIES AND WILDLIFE

By /s/ John C. Gatlin 12-14-60
Regional Director

Department of the Interior
Bureau of Reclamation
Rio Grande Project - New Mexico-Texas

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NATIONAL PARK SERVICE

| Date | Contract | Tab |
|---|---|---|
| Dec. 12, 1962 | Memorandum of Understanding and Agreement between the Bureau of Reclamation and the National Park Service for the Investigation, Planning, and Development of Recreational Resources at Elephant Butte and Caballo Reservoirs, Rio Grande, New Mexico (Contract No. 14-06-500-761) | 1 |

Contract No. 14-06-500-761

UNITED STATES DEPARTMENT OF THE INTERIOR

MEMORANDUM OF UNDERSTANDING AND AGREEMENT
between the
BUREAU OF RECLAMATION AND THE NATIONAL PARK SERVICE
for the
INVESTIGATION, PLANNING, AND DEVELOPMENT OF RECREATIONAL RESOURCES
at
ELEPHANT BUTTE AND CABALLO RESERVOIRS
RIO GRANDE, NEW MEXICO

THIS MEMORANDUM OF UNDERSTANDING AND AGREEMENT is entered into this 12th day of December, 1962, between the BUREAU OF RECLAMATION, hereinafter referred to as the Bureau, represented by the Regional Director of Region 5, Amarillo, Texas, and the NATIONAL PARK SERVICE, hereinafter referred to as the Service, represented by the Regional Director of Region 3, Santa Fe, New Mexico, pursuant to agreement between the Bureau of Reclamation and the National Park Service, approved by the Under Secretary of the Interior on April 5, 1955, which governs the relations of the Service and the Bureau and the responsibilities of each in a cooperative program for the investigation, planning, development, and administration of recreational resources and facilities in the vicinity of Reclamation reservoirs.

WITNESSETH THAT:

WHEREAS, by Public Law 87-542, 87th Congress, S.46 approved July 25, 1962, the Secretary of the Interior was authorized and directed to investigate, plan, construct, operate and maintain basic recreational facilities at Elephant Butte and Caballo Reservoirs, Rio Grande Federal Reclamation Project, and

WHEREAS, the Service, under agreement with the Bureau, has supplied preliminary plans and proposals for the development and administration of recreational facilities for Elephant Butte and Caballo Reservoirs.

NOW, THEREFORE, the parties hereto agree with respect to the development of the recreational aspects of the reservoirs, as follows:

1. The Service will perform survey and studies and make recreational development plans, and furnish data for designs and specifications all for basic recreational facilities to be provided at the reservoirs. The Service will assist the Bureau in supervision of construction of those facilities.

2. The Bureau will supply the Service with the field survey data and maps required by the Service for the preparation of the plans and construction designs contemplated by paragraph 1 above.

3. The Service will summarize its plans for recreational developments and facilities for the reservoir in a separate report.

4. The Bureau, subject to the availability of funds, will advance funds to the Service, in Fiscal Year 1963, in the amount of $24,000 to cover expense for preparation of complete plans for recreational facilities. Expenditures from funds advanced may be made for negotiations, investigations, development plans, and for other items necessary to carry out the provisions of this agreement: PROVIDED HOWEVER, That no such funds shall be expended to cover the costs of the normal, usual, and continuing functions and duties of the Service.

5. The Service will submit an itemized statement of expenditures at the end of each fiscal year, and will, upon completion of all of its work and full execution of its responsibilities under this agreement, refund to the Bureau any unexpended funds.

6. THIS MEMORANDUM OF UNDERSTANDING AND AGREEMENT shall be effective from the day first above written, and may be amended at any time by mutual consent of the Regional Directors.

IN WITNESS WHEREOF, the parties hereto have caused this instrument to be executed as of the date first hereinabove indicated.

BUREAU OF RECLAMATION

By _____
Regional Director

NATIONAL PARK SERVICE

By _____
Acting Regional Director