

PLANS and SPECIFICATIONS
for
MODIFICATION # 1
POWERLINE CHANNEL

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11. Items of Work and Construction Details

Items of work to be performed in conformance with this specification and the construction details therefor are:

D. Bid Item 3a. Excavation Structural

1. This item consists of the required excavation for field drains as shown on the drawings, the weir inlet Sta 371 + 80, bridge Sta 116 + 69.5, and the gated outlet Sta 9 + 70[±].
2. Measurement and payment will be made in accordance with Method 3. The lateral limits for the drain pipes shall be vertical planes 18 inches outside the pipe wall.



CONSTRUCTION SPECIFICATION

4A. EXCAVATION

1. SCOPE

The work shall consist of the excavation of all materials necessary for the construction of the work.

2. CLASSIFICATION

Excavation will either be designated as unclassified or be classified as common excavation or rock excavation in accordance with the following definitions:

Common excavation shall be defined as the excavation of all materials that can be excavated, transported, and unloaded by the combined or separate use of heavy ripping equipment and wheel tractor-scrappers and pusher tractors or that can be excavated and dumped into place or loaded onto hauling equipment by means of excavators having a rated capacity of not more than one cubic yard and equipped with attachments (such as shovel, bucket, backhoe, dragline or clam shell) appropriate to the character of the materials and the site conditions.

Rock excavation shall be defined as the excavation of all hard compacted or cemented materials the accomplishment of which requires blasting or the use of excavators larger than defined for common excavation. The excavation and removal of isolated boulders or rock fragments larger than one cubic yard in volume encountered in materials otherwise conforming to the definition of common excavation shall be classified as rock excavation.

The class of excavation will be determined by the Engineer on the basis of his determination of the character of the materials to be excavated and the prevailing site conditions.

The presence of isolated boulders or rock fragments larger than one cubic yard in size will not in itself be considered sufficient cause to change the classification of the surrounding material.

For the purpose of this classification, the following definitions shall apply:

Heavy ripping equipment shall be defined as a tractor-mounted, heavy duty, single-tooth, ripping attachment mounted on a tractor having a power rating of at least 200 net horsepower (at the flywheel).

Wheel tractor scraper shall be defined as a self-loading (not elevating) and unloading scraper having a struck bowl capacity of at least 12 yards.

Pusher tractor shall be defined as a track type tractor having a power rating of at least 200 net horsepower (at the flywheel) equipped with appropriate attachments.

3. UNCLASSIFIED EXCAVATION

Items of excavation designated as "Unclassified Excavation" shall include all materials encountered regardless of their nature or the manner in which they are removed. When excavation is unclassified, none of the definitions or classifications stated in Section 2 of this specification shall apply.

4. USE OF EXCAVATED MATERIALS

All suitable materials removed from the specified excavations may be used in the construction of the specified earth or rock filled portions of the permanent works. The suitability of materials for specific purposes will be determined by the Engineer.

5. DISPOSAL OF WASTE MATERIALS

All surplus or unsuitable excavated materials will be designated as waste and shall be disposed of at the locations shown on the drawings.

6. SPECIAL REQUIREMENTS FOR STRUCTURE AND TRENCH EXCAVATION

The side slopes necessary to maintain the stability of excavated surfaces may not necessarily coincide with the pay limits specified for structure excavation or trench excavation. Such works shall be so excavated, braced and supported as to safeguard the work and workmen, to provide the ground adjacent to the excavation will not slide or settle and to prevent damage to adjacent existing improvements. When such bracing and supporting is required, the width of the excavation shall be adjusted to allow for the space occupied by the sheeting, bracing or other supporting installations. The Contractor shall furnish, place and subsequently remove such supporting installations.

Such excavations shall be completed to the specified elevations and to sufficient length and width to include allowance for forms, bracing and supports, as necessary, before any concrete or earth fill is placed or any piles are driven within the limits of the excavation.

7. BORROW EXCAVATION

When the quantities of suitable materials obtained from specified

excavations are insufficient to construct the specified fill portions of the permanent works, additional materials shall be obtained from the designated borrow areas. The Engineer shall designate the extent of borrow pits within the limits of the designated borrow areas and the limits of the depth of cut in all parts of the borrow pits.

Borrow pits shall be excavated and finally dressed in a manner to prevent the creation of residual hazards or unsightly conditions by reason of steep or unstable side slopes.

8. OVEREXCAVATION OF STRUCTURE SUBGRADE

Excavation in rock beyond the limits of the specified cross sections and elevations shall be corrected by filling the resulting voids to the specified contours and elevations with portland cement concrete, Class 2500 or better.

Excavation in earth beyond the limits of the specified cross sections and elevations shall be corrected by filling the resulting voids to the specified contours and elevations with approved compacted earth fill.

9. MEASUREMENT AND PAYMENT

For items of work for which specific unit prices are established in the contract, the volume of each type and class of excavation will be measured within the specified limits and computed to the nearest cubic yard by the method of average cross-sectional end areas. Regardless of quantities excavated, the measurement for payment will be made to the specified pay limits.

(Method 1) The pay limits shall be as designated on the drawings.

(Method 2) The pay limits shall be neat lines and grades shown on the drawings.

(Method 3) The pay limits shall be defined as follows:

- a. The upper limit shall be the original ground surface as it existed prior to the start of construction operations except that where structure excavation is performed within a trench, channel or roadway or in areas designated for other previous excavation, the upper limit shall be the planes of the bottoms and side slopes of those trenches or channels or the modified ground surface resulting from the previous excavation.

- b. The lower limit shall be the elevation of the bottom of the proposed footings, floor slabs, pipe cradles and bedding except that for structures underlain by a continuous drainage blanket the lower limit shall be the elevation of the bottom of the drainage blanket.
- c. For cradled pipe conduits, box culverts or structures with vertical walls, the lateral limits shall be the vertical planes 18 inches outside of and parallel to the neat lines of the footings, floor slabs or pipe cradles. For structures with sloping sidewalls extending outward beyond the plan limits of the floor slab, the lateral limits shall be the planes of the bottom surfaces of the proposed side walls.
- d. When it is required to perform structure excavation in new embankment or other fill, the upper limit shall be the planes of the upper surfaces of the fill at the time the excavation is made.

(Method 4) The pay limits shall be defined as follows:

- a. The upper limit shall be the original ground surface as it existed prior to the start of construction operations except that where excavation is performed within areas designated for other previous excavation the upper limit shall be the modified ground surface resulting from the previous excavation.
- b. The lower and lateral limits shall be the true surface of the completed excavation.

(Method 5) The pay limits shall be defined as follows:

- a. The upper limit shall be the original ground surface as it existed prior to the start of construction operations except that where excavation is performed within areas designated for other previous excavation the upper limit shall be the modified ground surface resulting from the previous excavation.
- b. The lower and lateral limits shall be the neat lines and grades shown on the drawings.

(Applies to All Methods) Payment for each type and class of excavation will be made at the contract unit price for that type and class of excavation. Such payment will constitute full compensation for all labor, materials, equipment, and all other items necessary and incidental to the performance of the work.

Compensation for any item of work described in the contract but not listed in the bid schedule will be included in the payment for the item of work to which it is made subsidiary. Such items and the items to which they are made subsidiary are identified in Section 10 of this specification.

8. ITEMS OF WORK AND CONSTRUCTION DETAILS

Items of work to be performed in conformance with this specification and the construction details therefor are:

A. Bid Item 14b through 14m. Corrugated Metal Pipe

1. This item consists of the furnishing and placing of the corrugated metal pipe arch inlets at locations shown on the drawings.
2. The pipe and fitting shall be of the size and gage as shown on the drawings and shall conform to Material Specification 110. The pipe and fittings shall be Class I, annular corrugations, Shape 3, pipe arch cross section with Type A, bituminous coating in accordance with Federal Specification WW-P-00405.
3. Special fittings for bid item 14h thru 14m shall include standard flared end section and coupling band conforming to Material Specification 110, and installed according to manufacturer's recommendations.
4. Measurement and payment will be made in accordance with method 3 except that measurement for the laid length of pipe will be made along the base of the pipe.

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CONSTRUCTION SPECIFICATION

12. CORRUGATED METAL PIPE CONDUITS

1. SCOPE

The work shall consist of furnishing and placing circular, arched or elliptical corrugated metal pipe and the necessary fittings.

2. MATERIALS

Pipe and fittings shall conform to the requirements of Material Specification 110 or Material Specification 131, whichever is specified.

3. LAYING AND BEDDING THE PIPE

Unless otherwise specified, the pipe shall be installed in accordance with the manufacturer's recommendations. The pipe shall be laid with the outside laps of circumferential joints pointing upstream and with longitudinal laps at the sides at about the vertical midheight of the pipe. Field welding of corrugated galvanized iron or steel pipe will not be permitted. Unless otherwise specified, the pipe sections shall be joined with standard coupling bands. The pipe shall be firmly and uniformly bedded throughout its entire length to the depth and in the manner specified on the drawings.

Perforated pipe shall be laid with the perforations down and oriented symmetrically about a vertical center line. Perforations shall be clear of any obstructions at the time the pipe is laid.

4. BACKFILL

Unless otherwise specified, earth backfill shall be placed in the manner specified in Construction Specification 5 for fill adjacent to structures. Special care shall be taken to prevent lifting the pipe from the bedding by pressures exerted by tamping material under the haunches of the pipe.

5. STRUTTING

When required, struts or horizontal ties shall be installed in the manner specified on the drawings. Struts and ties shall remain in place until the backfill has been placed to a height of 5 feet above the top of the pipe at which time they shall be removed by the Contractor.

6. HANDLING THE PIPE

The Contractor shall furnish such equipment as is necessary to place the pipe without damaging the pipe or coatings. The pipe

shall be transported and handled in such a manner as to prevent bruising, scaling or breaking of the spelter coating or bituminous coating.

7. REPAIR OF DAMAGED COATINGS

Breaks or scuffs in bituminous coatings that are less than 36 square inches in area may be repaired by the application of two coats of hot asphaltic paint conforming to the requirements for bituminous coatings contained in the references cited in Material Specifications 110 and 131. Whenever individual breaks exceed 36 square inches in area or when the total area of breaks exceeds 0.5 percent of the total surface area of the pipe, the pipe will be rejected.

8. MEASUREMENT AND PAYMENT

(Method 1) For items of work for which specific unit prices are established in the contract, the quantity of each type, class, size and gage of pipe will be determined to the nearest 0.1 foot by measurement of the laid length of pipe along the centerline of the pipe. Payment for each type, class, size and gage of pipe will be made at the contract unit price for that type, class, size and gage of pipe. Such payment will constitute full compensation for furnishing, transporting and installing the pipe and fittings and all other items necessary and incidental to the completion of the work.

(Method 2) For items of work for which specific unit prices are established in the contract, the quantity of each type, class, size and gage of pipe will be determined to the nearest 0.1 foot by measurement of the laid length of pipe along the centerline of the pipe. Payment for each type, class, size and gage of pipe will be made at the contract unit price for that type, class, size and gage of pipe. Such payment will constitute full compensation for furnishing, transporting and installing the pipe and fittings and all other items necessary and incidental to the completion of the work except items designated as "special fittings." Payment for special fittings will be made at the contract lump sum price for special fittings (CMP).

(Method 3) For items of work for which specific unit prices are established in the contract, the quantity of each type, class, size and gage of pipe will be determined to the nearest 0.1 foot by measurement of the laid length of pipe along the centerline of the pipe. Payment for each type, class, size and gage of pipe will be made at the contract unit price for that type, class, size and gage of pipe. Such payment will constitute full compensation for furnishing, transporting and installing the pipe, including the necessary fittings and all other items necessary and incidental to the completion of the work except the special fittings and appurtenances listed separately in the bid schedule.

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Payment for each special fitting and appurtenance will be made at the contract unit price for that type and size of fitting or appurtenance.

Compensation for any item of work described in the contract but not listed in the bid schedule will be included in the payment for the item of work to which it is made subsidiary. Such items and the items to which they are made subsidiary are identified in Section 9 of the specification.

MATERIAL SPECIFICATION

110. ZINC-COATED IRON OR STEEL CORRUGATED PIPE

1. SCOPE

This specification covers the quality of zinc-coated iron or steel corrugated pipe and fittings.

2. PIPE

Zinc-coated iron or steel corrugated pipe and fittings shall conform to the requirements of Interim Federal Specification WW-P-00405 for the specified classes and shapes of pipe, and to the following additional requirements:

- a. Unless otherwise specified, circumferential shop riveted seams shall have a maximum rivet spacing of 6 inches, except that 6 rivets will be sufficient for 12-inch diameter pipe;
- b. When close riveted pipe is specified: (1) the pipe shall be fabricated so that the rivet spacing in the circumferential seams shall not exceed 3 inches, except that 12 rivets will be sufficient to secure the circumferential seams in 12-inch pipe, and (2) in those portions of the longitudinal seams that will be covered by the coupling bands the rivets shall have finished flat heads or the rivets and holes shall be omitted and the seams shall be connected by welding to provide a minimum of obstruction to the seating of the coupling bands.
- c. Double riveting or double spot welding of pipe less than 42 inches in diameter may be required. When double riveting or double spot welding is specified, the riveting or welding shall be done in the manner specified for pipe 42 inches or greater in diameter.

3. COATINGS

Coatings shall conform to the requirements of Interim Federal Specification WW-P-00405 for the specified types of coatings.

(110-1)

4. INSPECTION, TESTING AND CERTIFICATION

The pipe shall be inspected and tested by the methods specified in Interim Federal Specification WW-P-00405, except that:

- a. The Engineer shall have free access to the shop for inspection purposes, and every facility shall be extended to him for this purpose; and
- b. Field inspection by the Engineer will include an examination of the pipes for deficiencies in lengths of sheets used, nominal specified diameters, net length of finished pipe, and any evidence of poor workmanship, and may include the taking of samples for chemical analysis and determination of weight of zinc coating.

For the purpose of inspection, the Contractor shall furnish to the Engineer an itemized statement of the sizes and lengths of pipe in each shipment.

The material certification shall include: (1) the sheet manufacturer's statement of typical chemical analysis of the base metal and certified results of typical weight of zinc coating tests, and, (2) the fabricator's certified results of typical coating tests and weld strength tests, if applicable.

(110-2)

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8. ITEMS OF WORK AND CONSTRUCTION DETAILS

Items of work to be performed in conformance with this specification and the construction details therefor are:

A. Bid Item 17. Slide Gate

1. This item of work shall consist of the furnishing and installing of the slide gate on the gated outlet Sta 9 + 70⁺ complete with frame, stem, stem guides, and lift as shown on the drawings.
2. Material:
The gate shall conform to material Specification 137, type MLS-1, Class 10-0 with a 12-inch opening, flat back, and shall be complete with frame, stem, stem guides, lift, and incidentals as shown on the drawings.

B. Subsidiary Item, Handrail and Catwalk

1. This item shall consist of installing a handrail and catwalk as shown on the drawings.
2. The handrail shall consist of 2 inch diameter galvanized iron pipe and galvanized fittings conforming to Material Specifications 119 and 132. The catwalk shall consist of 2 inch by 12 inch wooden plank of construction grade, redwood or Douglas fir treated with creasote-coal tar solution or creasote petroleum solution conforming to Material Specs. 115 and 116.
3. No separate payment will be made for the handrail and catwalk. Compensation for all labor and materials will be included in Bid Item 17, Slide Gate.

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CONSTRUCTION SPECIFICATION

18. INSTALLING WATER CONTROL GATES

1. SCOPE

The work shall consist of furnishing and installing water control gates including gate stems, hoists, lifts and other necessary appurtenances.

2. MATERIALS

The gates furnished shall conform to the requirements specified in Section 8 or on the drawings. All gates shall be furnished complete with hoisting equipment and other specified appurtenances.

3. INSTALLING GATES

The Contractor shall install the gates in a manner that will prevent leakage around the seats and binding of the gates during operation.

Surfaces of metal against which concrete will be placed shall be unpainted and free from oil, grease, loose mill scale, surface rust and other debris or objectionable coatings.

Anchor bolts, thimbles and spigot frames shall be secured in true position in the forms and held in alignment during the placement of concrete.

Concrete surfaces against which rubber seals will bear or against which flat frames or plates are to be installed shall be finished to provide a smooth and uniform contact surface.

When flat frames are installed against concrete, a layer of bedding mortar shall be placed between the frame and the concrete.

When a gate is attached to a wall thimble, a mastic or resilient gasket shall be applied between the gate frame and the thimble, in accordance with the recommendation of the gate manufacturer.

For radial gates, wall plates, sills and pin brackets shall be adjusted and fastened by grouting and bolting after the gates have been completely assembled in place.

4. INSTALLING HOISTS AND LIFTS

Gate stems, stem guides and gate lifts shall be carefully aligned so that the stem shall be parallel to the guide bars or angles on the gate frame after installation.

Radial gate hoists shall be installed in correct alignment with relation to the gate shaft.

5. RADIAL GATE SEALS

On radial gates the rubber seals shall be installed in a manner such that when the gates are closed the seals shall contact the walls or wall plates throughout their entire length.

6. OPERATIONAL TESTS

After the gate and hoist (or lift) have been installed, they shall be cleaned, lubricated and otherwise serviced by the Contractor in accordance with the manufacturer's instructions. The Contractor shall test the gate and hoist by operating the system several times throughout its full range of operation. He shall make any changes and adjustments as are necessary to insure satisfactory operation of the gate system.

7. MEASUREMENT AND PAYMENT

The number of each type, size and class of gate will be counted. Payment for furnishing and installing each type, size and class of gate shall be made at the contract unit price for that type, size and class of gate. Such payment will constitute full compensation for all labor, materials, equipment and all other items necessary and incidental to the completion of the work including furnishing and installing anchor bolts and all specified appurtenances and fittings.

MATERIAL SPECIFICATION

115. STRUCTURAL TIMBER AND LUMBER

1. SCOPE

This specification covers the quality of structural timber, lumber and plywood used in the construction of permanent works of improvement.

2. GRADING

Structural timber and lumber shall be graded in accordance with the grading rules, applicable to the specified species, adopted by a lumber grading or inspection bureau or agency recognized as being competent and that conform to the basic provision of ASTM Designation D 245. The material supplied according to the commercial grading rules shall be of equal or greater stress value than the specified stress-grade.

Plywood shall be Douglas fir plywood conforming to the requirements of Commercial Standard CS 45, U. S. Department of Commerce, or western softwood plywood conforming to the requirements of Commercial Standard CS 122, U. S. Department of Commerce, whichever is specified.

3. QUALITY

All materials shall be sound wood free from decay. No boxed heart pieces of Douglas fir or redwood shall be used in stringers, floor beams, caps, posts, sills or other principal structural members. Boxed heart pieces are defined as timber so sawed that at any section in the length of a sawed piece the pith lies entirely inside the four faces.

4. HEARTWOOD REQUIREMENTS

All timber and lumber specified for use without preservative treatment shall contain not less than 75 percent heartwood on any diameter or on any side or edge, measured at the point where the greatest amount of sapwood occurs. This requirement shall not apply to timber and lumber for which pressure treatment with wood preservative is specified.

(115-1)

5. SIZES

The sizes specified are nominal sizes. Unless otherwise specified the material shall be furnished in American Standard dressed sizes.

6. MARKING

Each piece of timber and lumber shall be legibly stamped or branded with an official grade mark. Plywood shall be legibly stamped with an official mark designating the grade, type and surface finish as described in the cited Commercial Standards.

(115-2)

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MATERIAL SPECIFICATION

116. WOOD PRESERVATIVES AND TREATMENT

1. SCOPE

This specification covers the quality of wood preservatives and methods of treatment of wood products.

2. TREATING PRACTICES

Treating practices and sampling, inspection and test procedures shall conform to the requirements of Federal Specification TT-W-571, "Wood Preservation: Treating Practices."

3. PRESERVATIVES

The wood shall be treated with the specified type of preservative. Wood preservatives shall conform to the requirements of the applicable specifications listed in Federal Specification TT-W-571, Section 2.1.

4. QUALITY OF TREATED MATERIALS

Treated lumber, timber, piles, poles, or posts shall be free from heat checks, water bursts, excessive checking, results of chafing or from any other damage or defects that would impair their usefulness or durability for the purpose intended. The use of "s" irons will not be permitted. Holes bored for tests shall be filled with tight fitting treated plugs.

5. INSPECTION, TESTING, CERTIFICATION AND MARKING

Treated wood products shall be inspected and tested by the methods prescribed in Federal Specification TT-W-571, Section 4.2. The material certification shall include a certified report from the treatment plant stating the amount and character of treatment applied to the materials. Each treated wood item delivered to the job site shall be marked as specified in Federal Specification TT-W-571, Section 3.7.

(116-1)

MATERIAL SPECIFICATION

119. GALVANIZING

1. SCOPE

This specification covers the quality of zinc coatings applied to iron and steel products by the hot-dip process (galvanizing). This specification applies only to those products not covered in other material specifications.

2. QUALITY OF ZINC

The zinc used for coating shall be prime western spelter conforming to the requirements of ASTM Designation B 6.

3. QUALITY OF COATING

Zinc coatings shall conform to the requirements of the following specifications for the established classes of materials or, where applicable, the specified classes of coatings.

- a. Zinc coatings on products fabricated from rolled, pressed and forged steel shapes, plates, bars and strip shall conform to the requirements of ASTM Designation A 123;
- b. Zinc coatings on iron and steel hardware shall conform to the requirements of ASTM Designation A 153;
- c. Zinc coatings on assembled steel products shall conform to the requirements of ASTM Designation A 386.

4. INSPECTION, TESTING AND CERTIFICATION

Zinc coatings shall be inspected and tested by the methods prescribed in the specifications cited herein. The material certification shall include the manufacturer's certified statement of results of typical weight of zinc coating tests.

(119-1)

MATERIAL SPECIFICATION

132. WROUGHT IRON PIPE AND FITTINGS

1. SCOPE

This specification covers the quality of wrought iron pipe.

2. QUALITY

Wrought iron pipe shall conform to the requirements of Federal Specification WW-P-441 for the specified class and condition of pipe, or ASTM Designation A 419, whichever is specified.

3. FITTINGS

Threaded fittings shall conform to the requirements of Federal Specification WW-P-521 for the types and kinds specified.

Forged flanges, fittings and valves shall conform to the requirements of ASTM Designation A 181 for the grade of materials specified.

4. INSPECTION, TESTING AND CERTIFICATION

Pipe and fittings shall be inspected and tested by the methods prescribed in the specifications cited herein. The material certification for pipe shall include the manufacturer's certified statement of results of typical tension tests, fracture tests, bending tests and weight of zinc coating tests, as applicable to the type of pipe furnished. The material certification for fittings shall include the manufacturer's certified statement of results of typical malleability tests and aerostatic or hydrostatic pressure tests.

MATERIAL SPECIFICATION

137. SLIDE GATES (SLUICE GATES), METAL, LIGHT DUTY

1. SCOPE

This specification covers the quality of light duty, metal slide gates (sluice gates) for water control.

2. CLASS AND TYPE OF GATE

The class of gate will be expressed as a numerical symbol composed of the seating head and unseating head which the gate must be built to withstand. The two numbers will be separated by a hyphen with the seating head listed first. For this purpose the heads shall be expressed in terms of feet of water.

The gates shall be of the specified types as defined below:

Type MLS-1 gates shall be cast iron with cast iron seat facings.

Type MLS-2 gates shall be cast iron with bronze seat facings.

Type MLS-3 gates shall be fabricated metal gates.

3. QUALITY OF MATERIALS

Materials used in the manufacture of slide gates shall conform to the requirements of the following specifications:

Iron castings shall conform to Federal Specification QQ-I-652, Class 25 or higher.

Structural steel shall conform to the requirements of Federal Specification QQ-S-741.

Cold rolled steel bars shall conform to the requirements of Federal Specification QQ-S-653, Composition No. C1018 or No. C1045, in the condition and finish appropriate to structural or operational requirements.

Steel sheet and strip shall conform to the requirements of Federal Specification QQ-S-698.

Zinc coated iron and steel sheets shall conform to the requirements of Federal Specification QQ-S-775.

Naval bronze shall conform to the requirements of ASTM Designation B 21.

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Cast bronze shall conform to the requirements of Federal Specification QQ-B-726.

Rubber for gaskets and seals shall conform to the requirements of ASTM Designation D735, Type R, Grade 805.

4. CAST IRON GATES

The frame shall be cast iron and of the specified type. The front face shall be machined to receive the gate guides and the rear face shall be machined as required to match the specified attaching means.

The gate slide shall be cast iron and shall be built to withstand the seating and unseating heads expressed by the gate class designation, as defined in Section 2 of this specification.

Grooves shall be cast on the vertical sides of the slide to match the guide angles.

The gate guides shall be galvanized structural steel and shall be built to withstand the total thrust of the gate slide due to water pressure and wedge action. Guides shall be galvanized in accordance with the requirements of Material Specification 119.

Wedges and wedge seats shall have smooth bearing surfaces. Wedges may be cast as integral parts of the slide. Removable wedges and wedge seats shall be fastened to the slide, frame or guides by means of suitable studs, set screws or bolts. Each interacting set of wedge and wedge seat shall be adjustable as needed to insure accurate and effective contact. Adjusting bolts or screws shall be bronze or galvanized steel.

Seat facings shall be machined to a smooth finish to insure proper watertight contact. Bronze facings shall be securely attached by welding or by another approved method.

5. FABRICATED METAL GATES

Fabricated metal gates shall be built to withstand the seating head expressed by the gate class designation. Unless otherwise specified, the gates shall be galvanized steel with flat-back frames.

6. YOKE

When a self-contained gate is specified, the yoke shall be galvanized structural steel and of such design as to capably withstand the loads resulting from operation of the gate.

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7. GATE STEM AND LIFT (OR HOIST)

The gate stem and lift (or hoist) shall be of the specified type, size and capacity.

Unless otherwise specified, the stem shall be cold rolled steel and shall be furnished in sections as necessary to permit reasonable ease in installation. Couplings shall be bolted, pinned or keyed to the stem. The stem shall be furnished with machine-cut, single lead, right-hand 29° Acme threads of sufficient length to completely open the gate.

The lift shall be compatible with the type of stem furnished. Unless otherwise specified, the lift nut shall be cast bronze and shall be fitted with ball or roller thrust bearings designed to withstand the normal thrust developed during opening and closing of the gate at the maximum operating heads. All gears, sprockets and pinions shall be machine-cut, with ratios and strength adequate to withstand operating loads. Sufficient grease fittings shall be provided to allow lubrication of all moving parts. An arrow and the word "open" shall be cast on the rim of the handwheel or on the lift housing to indicate the direction of opening.

Provision shall be made to prevent stem rotation at the connection with the gate slide.

Stop collars shall be provided to prevent over-travel in closing the gate.

8. STEM GUIDES

Unless otherwise specified, stem guides shall be cast iron and adjustable in two directions.

9. WALL THIMBLE

When a wall thimble is specified, it shall be cast iron and of the section, type and depth specified. The front flange shall be machined to match the gate frame and drilled and tapped to accurately receive the gate attachment studs.

10. FASTENERS

Unless otherwise specified, all anchor bolts and other fasteners shall be galvanized steel or bronze.

11. INSTALLATION INSTRUCTIONS

The Contractor shall supply the manufacturer's complete installation data, instructions for adjustments and drawings or templates showing the location of anchor bolts for each gate.

12. PAINING

When specified, gates and accessories shall be painted by the designated systems.

13. CERTIFICATION

The material certification shall include the name of the manufacturer, the manufacturer's model number (for standard catalog items) or the seating and unseating heads for which the gate is designed together with such drawings and materials data as may be necessary to show that the gate conforms to the requirements of this specification.

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9. ITEMS OF WORK AND CONSTRUCTION DETAILS

Items of work to be performed in conformance with this specification and the construction details therefor are:

A. (See previous Specification, Painting)

B. Subsidiary Item, Painting

1. This item shall consist of the painting of all exposed surfaces of the gate assembly of the gated outlet Sta 9 + 70⁺.
2. Paint application shall be in accordance with Paint System A and shall conform to Construction Specification 22.
3. No separate payment will be made for painting. Compensation for painting will be included in the payment for Bid Item 17, Slide Gate.

CONSTRUCTION SPECIFICATION

22. CLEANING AND PAINTING METALWORK

1. SCOPE

The work shall consist of cleaning metal surfaces and applying paints and protective coatings.

2. PAINTS

For the purposes of this specification paints shall be designated by types as defined below:

Type 1 paint shall conform to the requirements of Federal Specification TT-P-86, Type IV, Red Lead Base Paint.

Type 2 paint shall conform to the requirements of Federal Specification TT-P-86, Type II or Type III, Red Lead Base Paint.

Type 3 paint shall conform to the requirements of Federal Specification TT-P-86, Type I, Red Lead Base Paint.

Type 4 paint shall conform to the requirements of Federal Specification TT-P-636, Synthetic Primer.

Type 5 paint shall be prepared by mixing aluminum paste conforming to the requirements of Federal Specification TT-P-320, Type II, Class B with phenolic resin spar varnish conforming to the requirements of Federal Specification TT-V-119 at the rate of two pounds of aluminum paste per gallon of varnish. The paint shall be mixed at the time of use.

Type 6 paint shall be prepared by mixing aluminum paste conforming to Federal Specification TT-P-320, Type II, Class B with mixing varnish conforming to the requirements of Federal Specification TT-V-81, Type II, Class B at the rate of two pounds of aluminum paste per gallon of varnish. The paint shall be mixed at the time of use.

Type 7 paint shall conform to the requirements of Federal Specification TT-E-489, Class A, Alkyd Gloss Enamel.

Type 8 paint shall conform to the requirements of Federal Specification TT-E-529, Alkyd Semi-Gloss Enamel.

Type 9 paint shall conform to the requirements of Federal Specification TT-P-641, Type I or Type II, Zinc Dust-Zinc Oxide Primer.

Type 10 paint shall conform to the requirements of Federal Specification TT-P-641, Type III, Zinc Dust-Zinc Oxide Primer.

Type 11 paint shall conform to the requirements of Material Specification 139. The paint shall be mixed at the time of use.

Paints of Types 1, 2, 3, 5 and 6 may be thinned with mineral spirits as necessary for proper application but the amount of thinner used shall not exceed one pint per gallon of paint. Other paints may be thinned in accordance with the manufacturer's instructions only if such thinning is approved by the Engineer.

When tinting is required, it shall be accomplished by the addition of pigment-in-oil tinting colors conforming to the requirements of Federal Specification TT-P-381.

Mineral spirits shall conform to the requirements of Federal Specification TT-T-291, Grade 1, Light Thinner.

3. SURFACE PREPARATION

Surfaces to be painted shall be thoroughly cleaned prior to the application of the paint. For the purposes of this specification methods of surface preparation shall be designated as defined below:

Method 1 surface preparation shall consist of the removal of all grease and oil by means of steam cleaning or solvent cleaning methods and removal of all dirt, rust, mill scale and other coatings by means of sandblasting, grit blasting or pickling. The finished surface shall uniformly expose the base metal and shall present an etched, but not polished or peened, appearance. Not more than 5 percent of the surface may exhibit very light shadows, light streaks, or slight discolorations caused by rust stain, mill scale oxides, or slight, tight residues of paint or coating.

Method 2 surface preparation shall consist of the removal of all grease and oil by means of steam cleaning or solvent cleaning and the removal of all dirt, surface rust and loose scale by means of wire brushing, flame cleaning, use of rotary abrading tools or light sandblasting.

Method 3 surface preparation shall consist of the treatment of the surface with a dilute acid solution. The surface shall be thoroughly wetted with a dilute (about 5 percent strength) phosphoric acid solution. After the acid has dried, the surface shall be thoroughly rinsed with clear water and allowed to dry. Dirt grease and oil shall be removed from the surface by solvent cleaning prior to the acid treatment.

Cleaning solvent shall be mineral spirits. Cleaning cloths and solvents shall be discarded before they become contaminated to the extent that a greasy film would remain on the surface being cleaned. The final cleaning and wiping shall be done with clean solvent and clean cloths. Grit blasting shall be accomplished using compressed air blast nozzles and grit made of steel, malleable iron or cast iron crushed shot. Abrasives used shall have a maximum particle size that will pass the No. 16 sieve (U. S. Standard) and a minimum size that will be retained on the No. 50 sieve (U. S. Standard). The equipment used for sandblasting shall be equipped with adequate separators and traps to insure that the compressed air shall be free of detrimental amounts of water and oil. Blast cleaned surfaces shall be brushed, blown or vacuum cleaned to remove any trace of blast products or abrasives prior to painting.

Surfaces that are not to be painted immediately after cleaning shall be treated with one brush coat of metal conditioner conforming to the requirements of Military Specification MIL-M-10578, except that surfaces cleaned by pickling in phosphoric acid solution shall not require such treatment.

Surfaces shall be thoroughly dry before paint is applied.

No field coats of paint shall be applied until the prepared surfaces have been inspected and approved by the Engineer.

4. PAINT SYSTEMS

For the purposes of this specification systems of preparing and painting metalwork will be designated as defined below:

Paint System A shall consist of the preparation of the surfaces to be painted by Method 1 and the application of two priming coats of Type 1 paint and two or more top coats of Type 5 paint as necessary to provide a total dry paint film thickness of 6 mils.

Paint System B shall consist of the preparation of the surfaces to be painted by Method 1 and the application of one priming coat of Type 1 paint and two top coats of Type 5 paint.

Paint System C shall consist of the preparation of the surfaces to be painted by Method 2 and the application of one priming coat of Type 2, Type 3 or Type 4 paint and two top coats of Type 6 paint.

Paint System D shall consist of the preparation of the surfaces to be painted by Method 2 and the application of one priming coat of Type 2 paint and two top coats of Type 7 paint.

Paint System E shall consist of the preparation of the surfaces to be painted by Method 2 and the application of one priming coat of Type 2 paint and two top coats of Type 8 paint.

Paint System F shall consist of the preparation of the surfaces to be painted by Method 3 and the application of two coats of Type 9 paint.

Paint System G shall consist of the preparation of the surfaces to be painted by Method 3 and the application of two coats of Type 10 paint.

Paint System H shall consist of the preparation of the surfaces to be painted by Method 1 and the application of four or more coats of Type 1 paint as necessary to provide a total dry paint film thickness of 6 mils.

Paint System I shall consist of the preparation of the surfaces to be painted by Method 1 and the application of two or more coats of Type 11 paint as necessary to provide a total dry paint film thickness of at least 16 mils.

5. APPLICATION OF PAINT

Surfaces shall be painted immediately after preparation (or within two days after preparation and treatment with metal conditioner) with at least one coat of the type of priming paint required by the specified paint system. Surfaces not required to be painted shall be protected against contamination and damage during the cleaning and painting operation.

Paints shall be thoroughly mixed at the time of application.

After erection or installation of the metalwork, all damages to shop applied costs shall be repaired and all bolts, nuts, welds and field rivet heads shall be cleaned and painted with one coat of the specified priming paint.

Except on surfaces accessible only to spray equipment, initial priming coats shall be applied by brush. All other coats may be applied by brush or spray. Each coat shall be applied in such a manner as to produce a paint film of uniform thickness with a rate of coverage within the limits recommended by the paint manufacturer.

The drying time between coats shall be as prescribed by the manufacturer of the paint but not less than that required for the paint film to dry through. The elapsed time between the application of the first and second prime coats of Paint System A shall not exceed 60 hours. In the application of Paint System I, if, for any reason, the first coat dries hard before the second

coat is applied or the elapsed time between coats exceeds 48 hours, the method of application must be modified in any of the following ways: (1) the first coat must be wiped down with MIBK with the application of the second coat following the wipedown by not more than 6 feet; or (2) the first coat must be lightly brush blasted or given a fog coat of the paint before application of the full second coat; or (3) a special bonding additive supplied by the paint manufacturer must be mixed with the paint applied in the second coat.

The finished surface of each coat shall be free from runs, drops, ridges, laps or excessive brushmarks and shall present no variation in color, texture and finish.

The surface of each dried coat shall be cleaned as necessary before application of the next coat.

Except for Paint System I, the first coat of each two-coat system shall be tinted for contrast. The first coat of red-lead paint shall be tinted by the addition of 3 ounces per gallon of 1B black pigment. The first coat of machinery paint shall be tinted off color with 3 ounces per gallon of a pigment suitable to the color of the paint.

6. ATMOSPHERIC CONDITIONS

Paint shall not be applied when the temperature of the item to be painted or of the surrounding air is less than 50°F. For Paint System I, the temperature of the coated surface must be maintained at not less than 50°F for 6 hours after the application of each coat. Painting shall be done only when the humidity and temperature of the surrounding air and the temperature of the metal surfaces are such that evaporation rather than condensation will result during the period of time required for application and drying. Surfaces protected from adverse atmospheric conditions by special cover, heating or ventilation shall remain so protected until the paint is dry.

7. CERTIFICATION AND TESTS

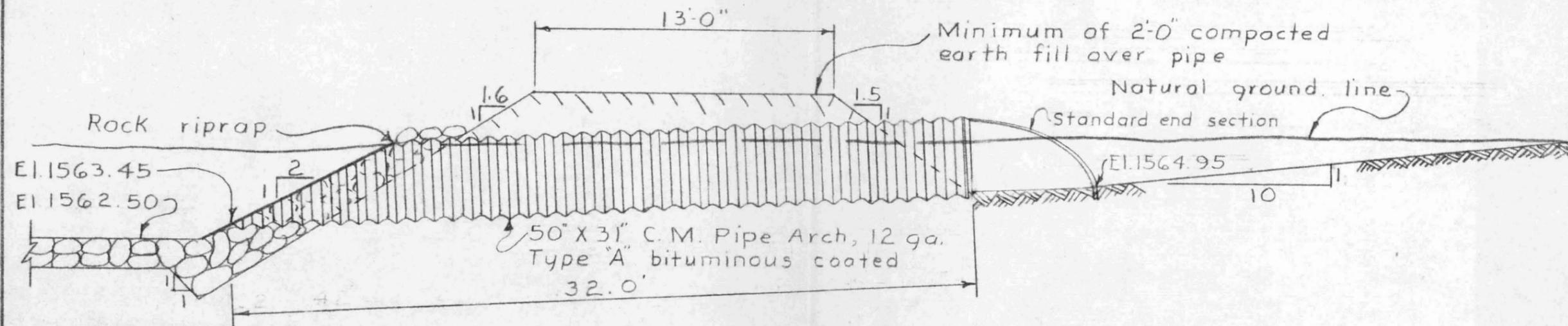
The material certification shall include material identification, quantity, batch number and certified results of tests performed by the manufacturer or other laboratory covering all of the requirements of the specifications under which the material is furnished.

Acceptance of dry paint film thickness for Paint Systems A, H, and I will be based on the measurement of paint film thickness by means of an Elcometer or other suitable dry film thickness gage.

8. PAYMENT

For items of work for which specific lump sum prices are established in the contract, payment for painting metalwork will be made at the contract lump sum price. Such payment will constitute full compensation for furnishing, preparing and applying all materials and for the cleaning, painting and coating of metalwork including labor, tools, equipment and all other items necessary and incidental to the completion of the work.

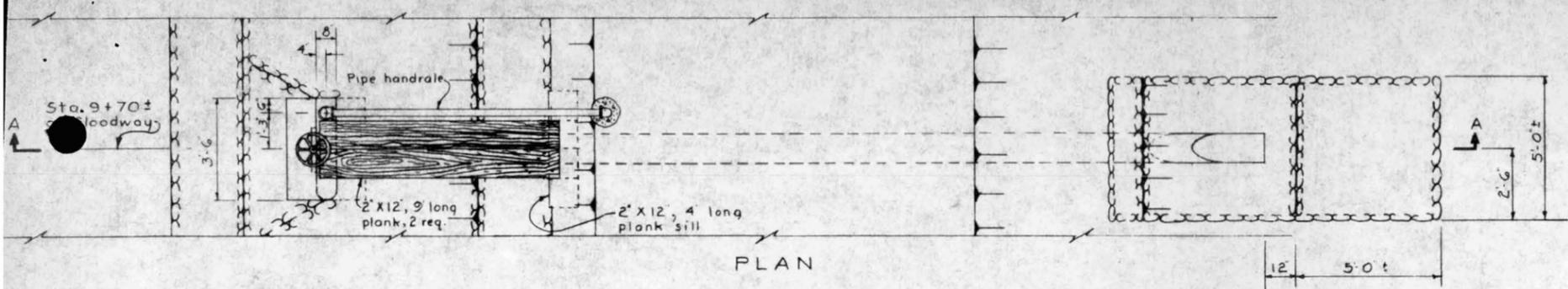
Compensation for any item of work described in the contract but not listed in the bid schedule will be included in the payment for the item of work to which it is made subsidiary. Such items and the items to which they are made subsidiary are identified in Section 9 of the specification.



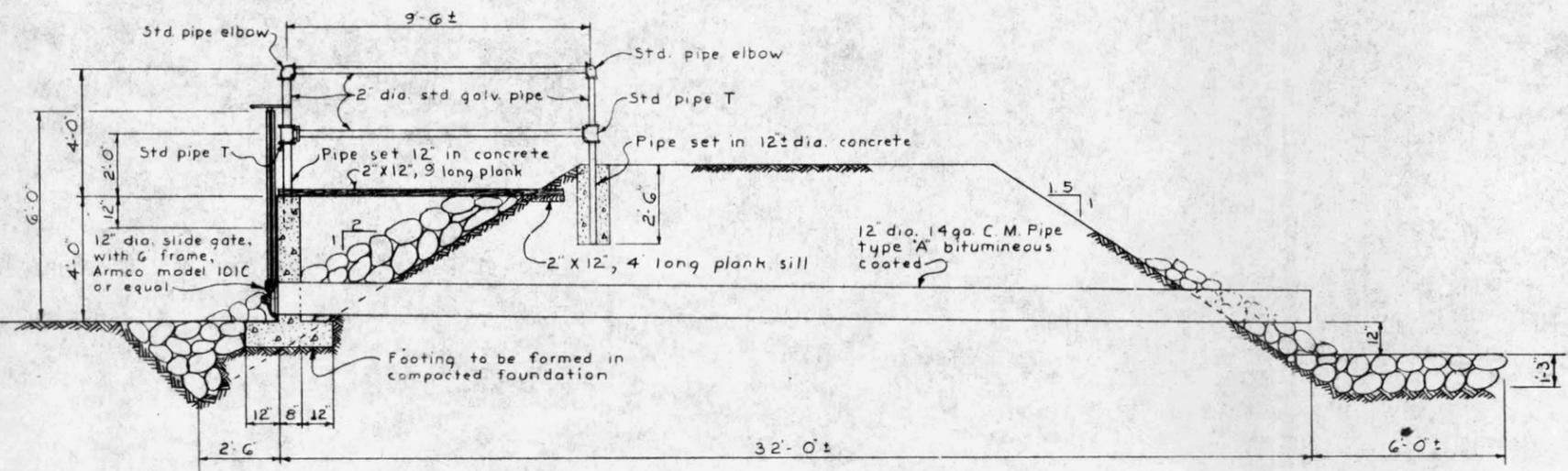
DRAIN INLET STATION 7+87± @ P.I. POWERLINE FLOODWAY

Not to scale

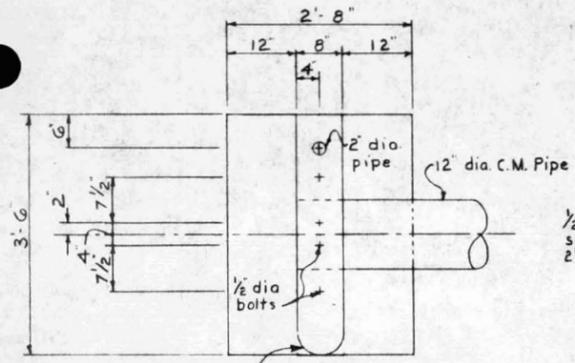
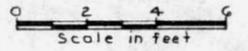
U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	
DESIGNED BY G. Hanley	APPROVED BY
CHECKED BY R. Arrington	DRAWING NO. 7-E 20598
DATE: 5-31-67	SHEET 15a OF 44



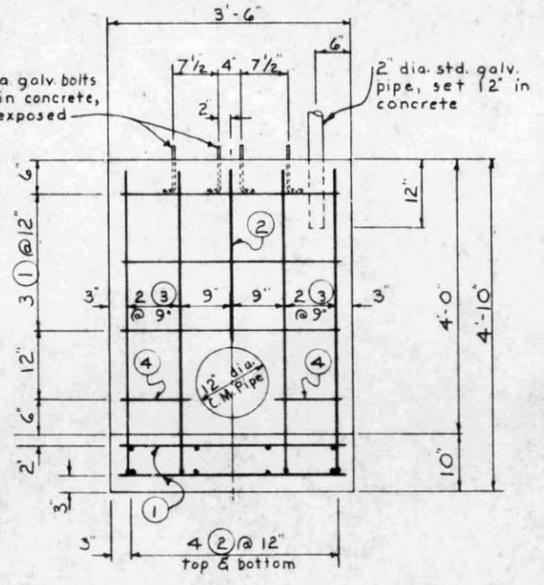
PLAN



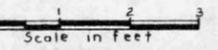
SECTION A-A



PLAN



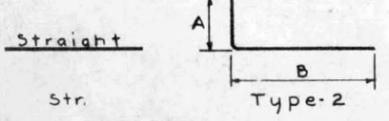
ELEVATION



BAR SCHEDULE

Mark	Size	Quantity	Length	Total Length	Type	A	B
M 1	4	12	3-3	39-0	Str.		
M 2	4	9	2-3	20-3	Str.		
M 3	4	8	5-3	42-0	2	1-0	4-3
M 4	4	4	1-0	4-0	Str.		
				Total	105-3		

BAR TYPES

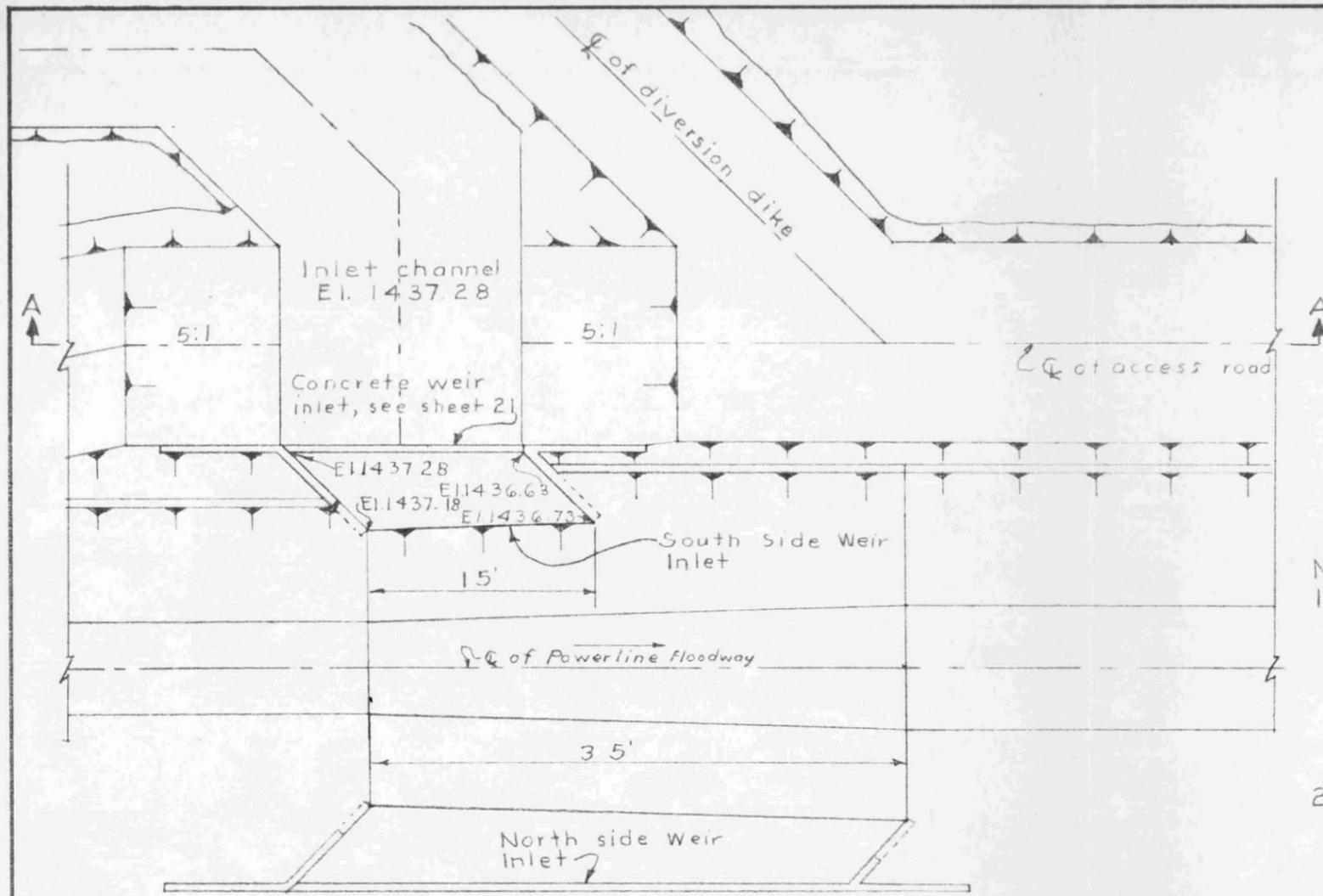


Quantities: Concrete ----- = 0.63 Yd³
Reinforcing Steel = 71.0 Lbs.

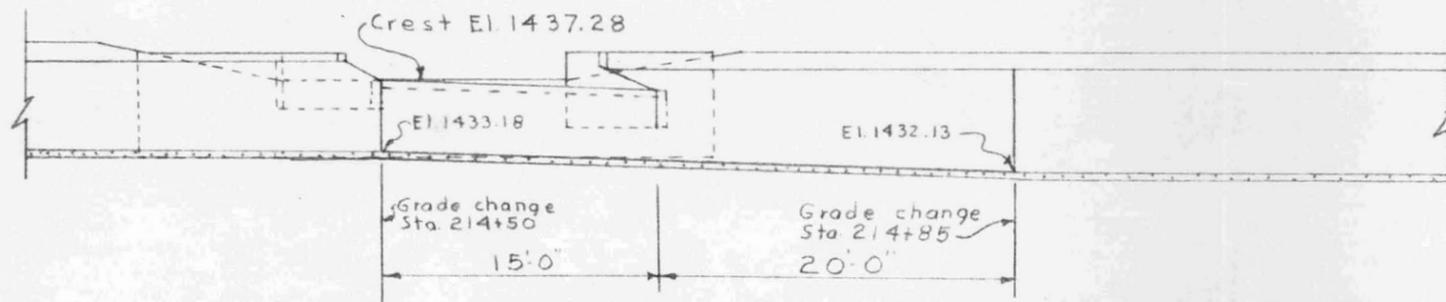
Note: 1. Chamfer all exposed concrete edges 3/4"
2. Plank for catwalk is to be construction grade Redwood or Douglas Fir treated with creosote oil.

DETAILS OF GATED OUTLET STA. 9+70
POWERLINE FLOODWAY
APACHE JUNCTION-GILBERT W.P.P.
MARICOPA & PINAL COUNTIES, ARIZONA
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Designed by R. Arrington	Date	Approved by
Drawn by G. Hanley 6-2-67		Title
Traced	Sheet No. 5b	Drawing No.
Checked by R. Arrington	of 44	7-E-20598



PLAN



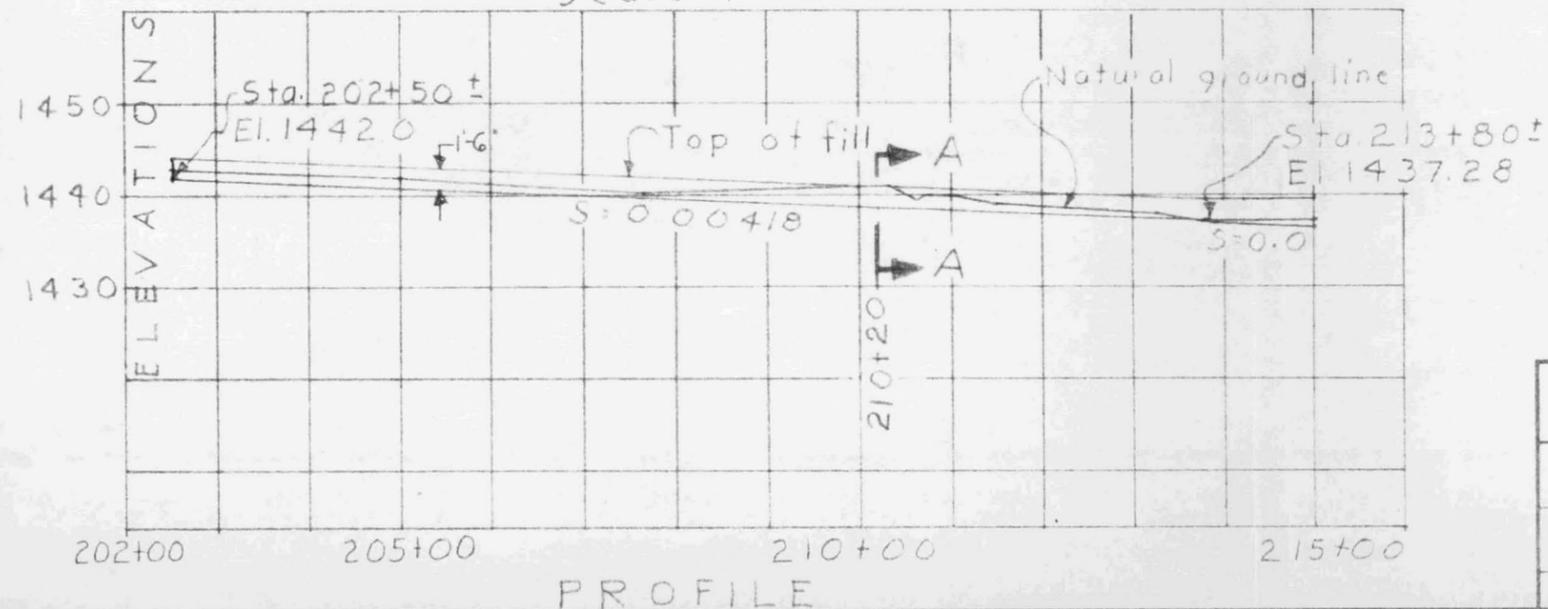
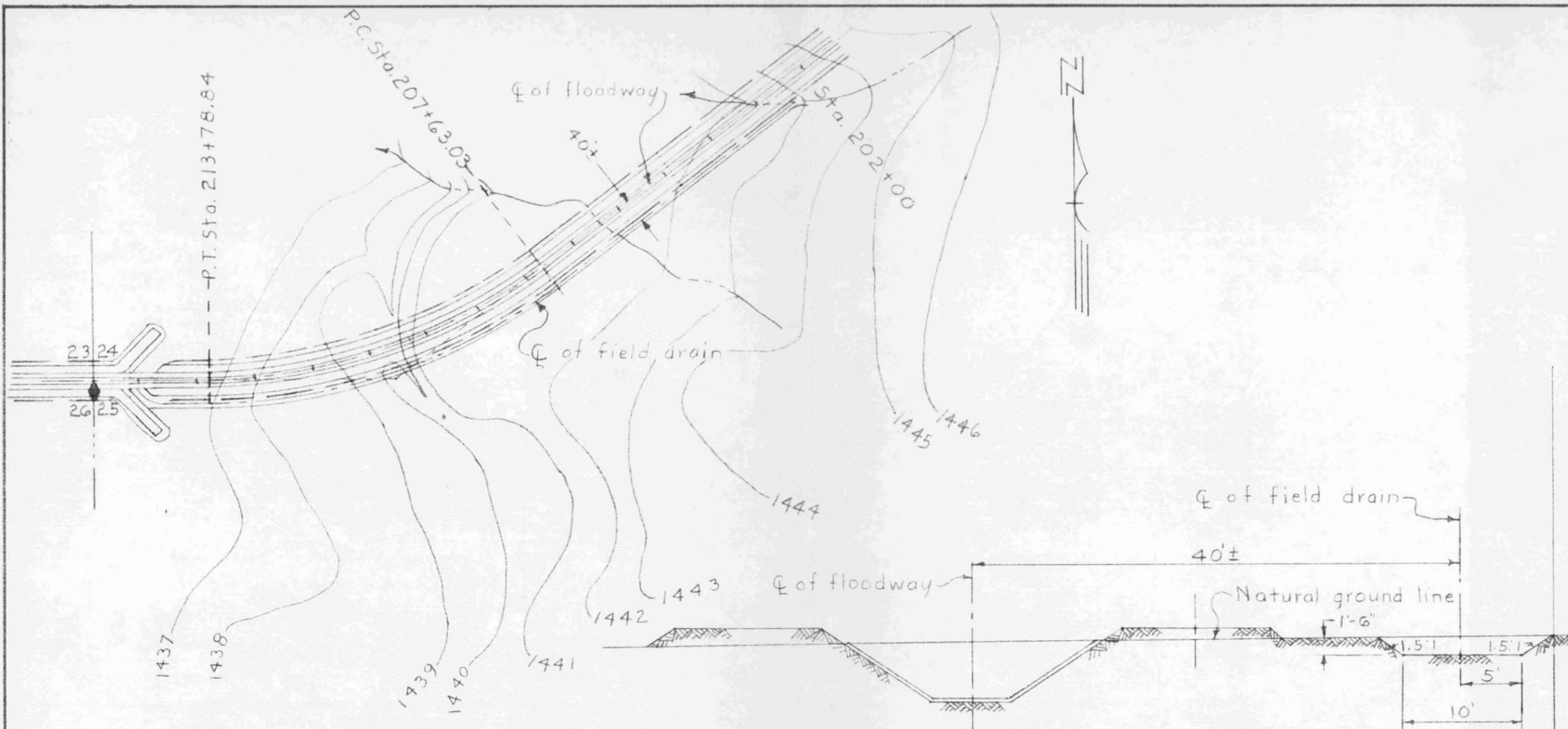
PROFILE A-A

NOTES:

1. Reinforcing steel corrections Mark E 2 reduce to 52 bars, E 3 reduce to 10 bars for North side Weir Inlet only, add 5 31'-0" no. 4 bars to lower headwall to replace Mark E 3 in the South side Weir Inlet. Correct Quantities table to 916.5 Lin.ft., & 613 lbs.
2. Concrete quantities correction, volume for North side structure 7.35 Yd³, for South side structure 5.86 Yd³, total 13.31 Yd³.
3. Welded wire fabric 6X6-6/6, North side structure 77 lbs., South side structure 48 lbs.

DETAILS OF WEIR INLET STA 214+50
POWERLINE FLOODWAY

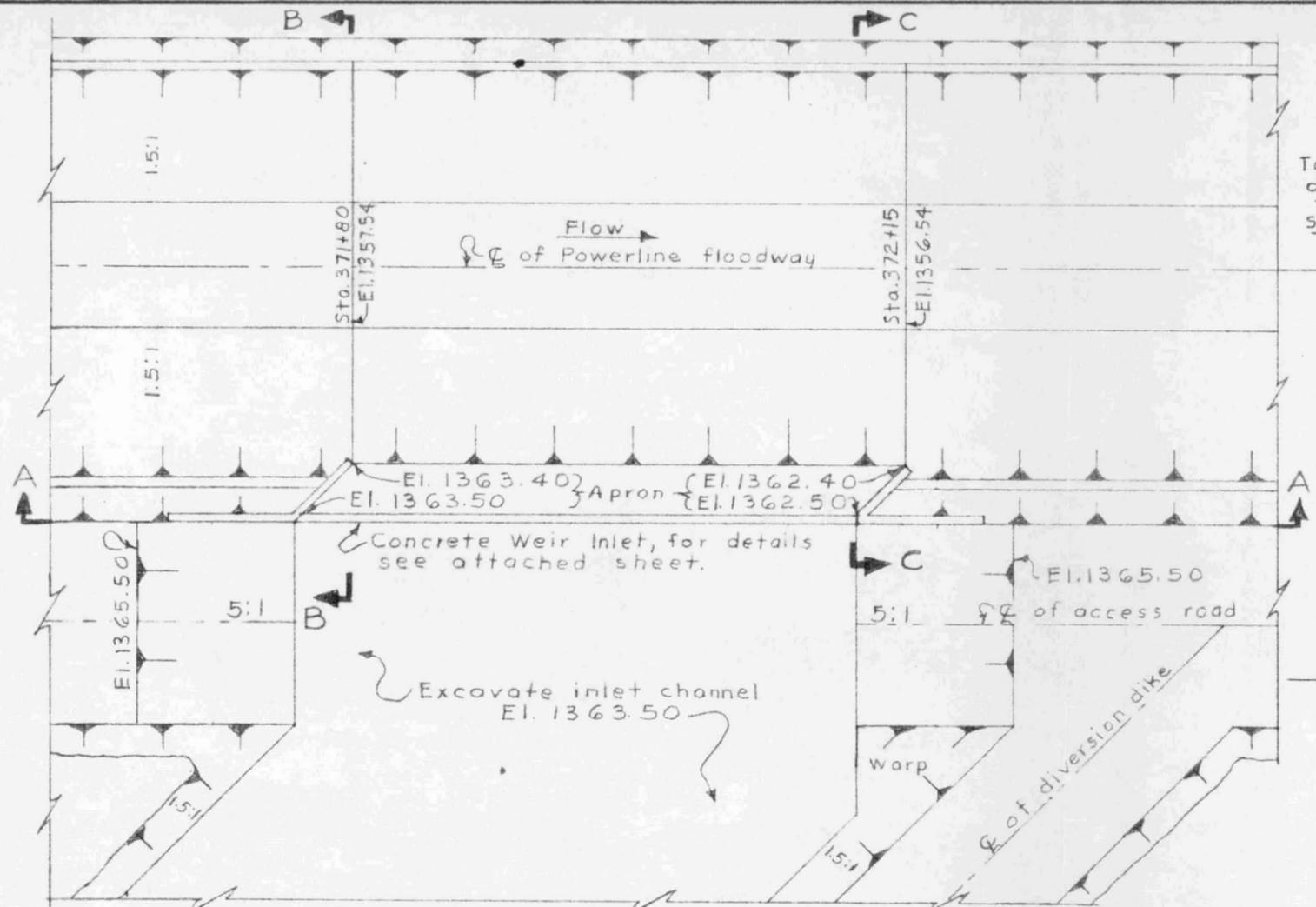
U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	
DESIGNED BY R. Arrington, G. Hanley	APPROVED BY
CHECKED BY R. Arrington	DRAWING NO. 7-E-20598
DATE: 6-6-67	SHEET 20a OF 44



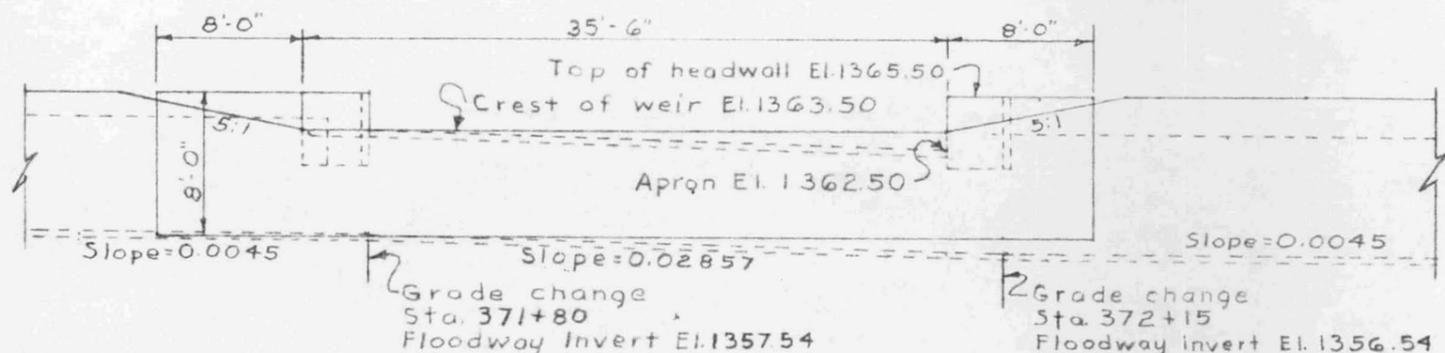
Drain excavation 550 Yd³.

FIELD DRAIN STA. 202+50 TO 214+50
POWERLINE FLOODWAY

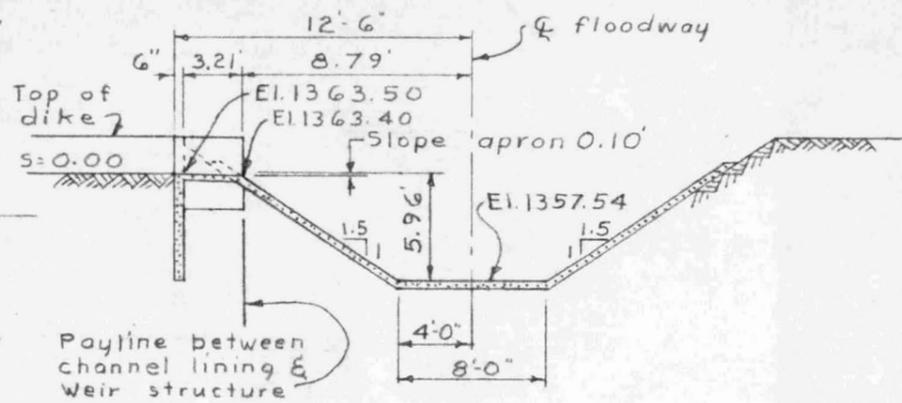
U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	
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CHECKED BY R. Arrington	DRAWING NO. 7E 20598
DATE 6-5-67	SHEET 20b OF 44



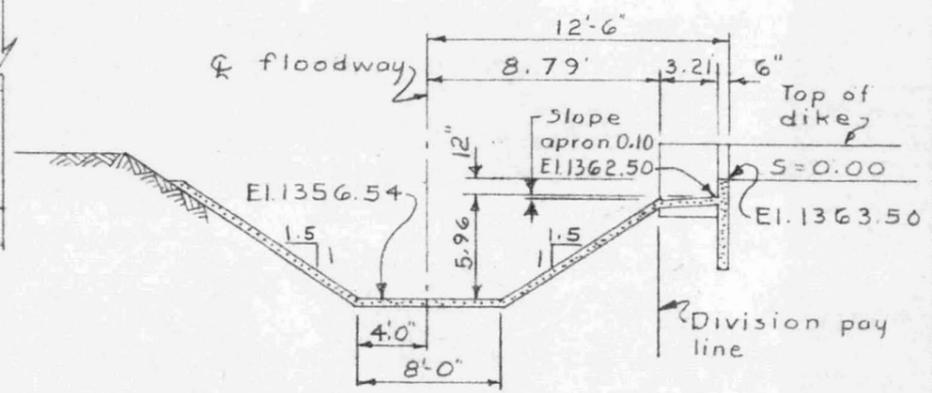
PLAN



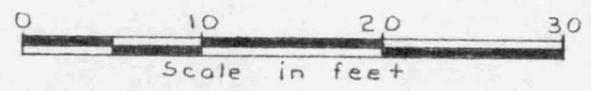
ELEVATION A-A



SECTION B-B

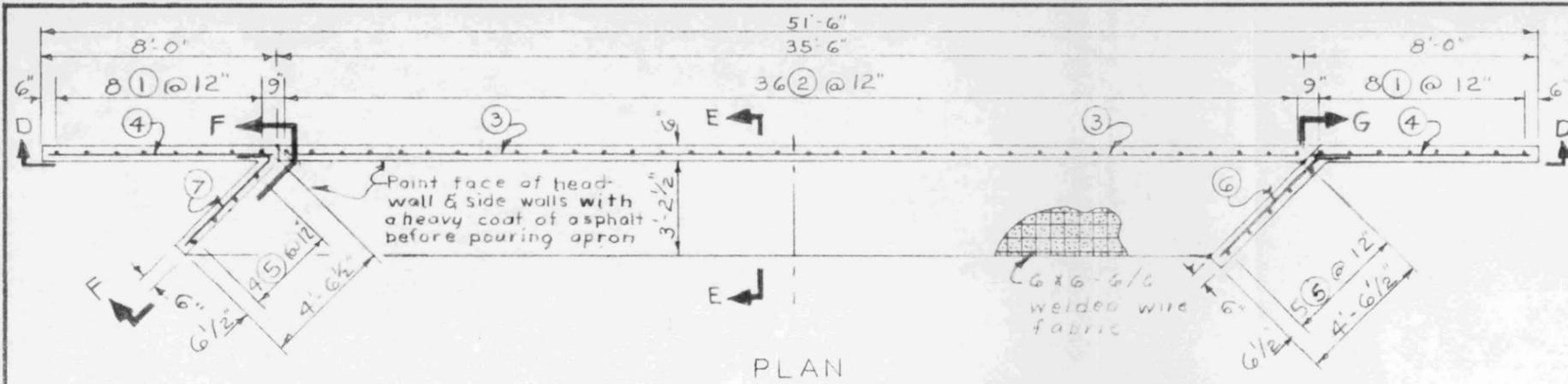


SECTION C-C



DETAILS OF WEIR INLET
STA. 371+80
POWERLINE FLOODWAY

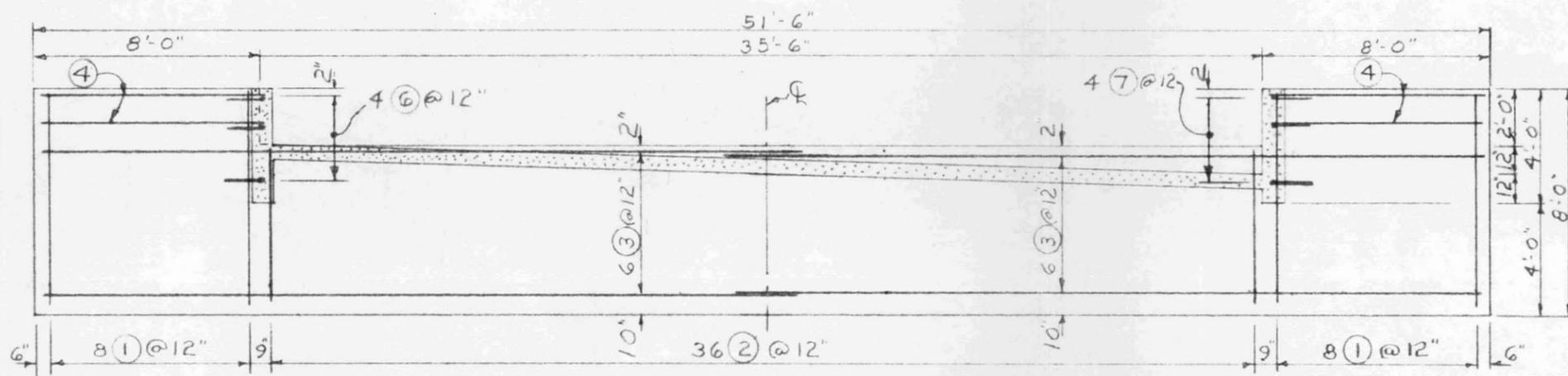
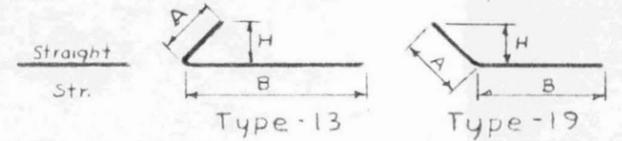
U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	
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CHECKED BY R. Arrington	DRAWING NO. 7-E 20598
DATE: 6-7-67	SHEET 23a OF 44



PLAN

Mark	No	Size	Quantity	Length	Total Length	Type	A	B	H
N	1	4	16	7-6	120-0	Str.			
N	2	4	36	5-6	198-0	Str.			
N	3	4	12	26-6	318-0	Str.			
N	4	4	4	7-6	30-0	Str.			
N	5	4	9	3-6	31-6	Str.			
N	6	4	4	5-6	22-0	19	1-0	4-6	0-8 1/2
N	7	4	4	5-6	22-0	13	1-0	4-6	0-8 1/2

BAR TYPES

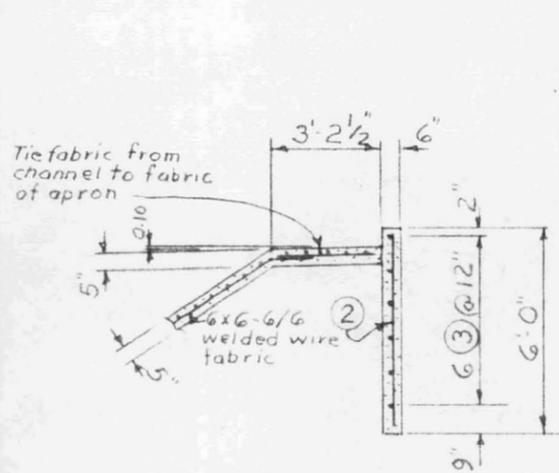


SECTIONAL ELEVATION D-D

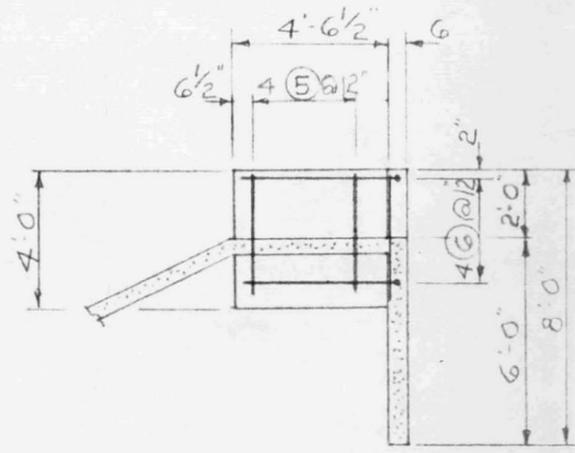
- Notes:
- 1 All exposed concrete edges shall be chamfered 3/4"
 - 2 All bar dimensions are out to out of bar.
 - 3 Radius of bends of bars N 6 and N 7 = 6"
 - 4 Sidewalls and headwall may be poured monolithically and apron poured last.

QUANTITIES TABLE

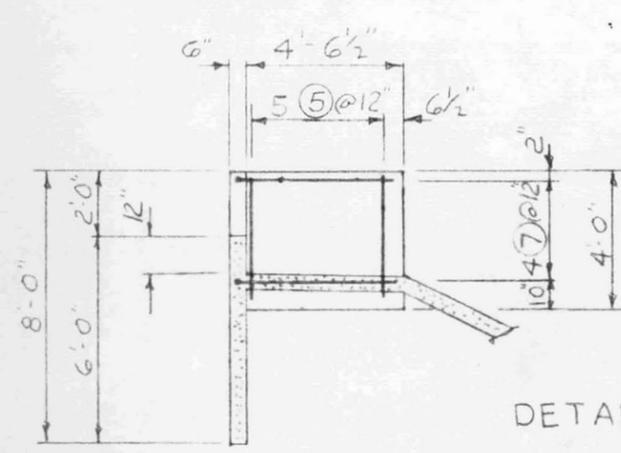
Item	Lin. ft.	Lbs.
No. 4 bars	741.5	494
6x6-6/6 fabric		49
Concrete	9.31 cu. yd.	



SECTION E-E

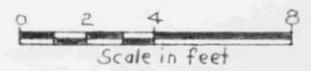


SECTION F-F

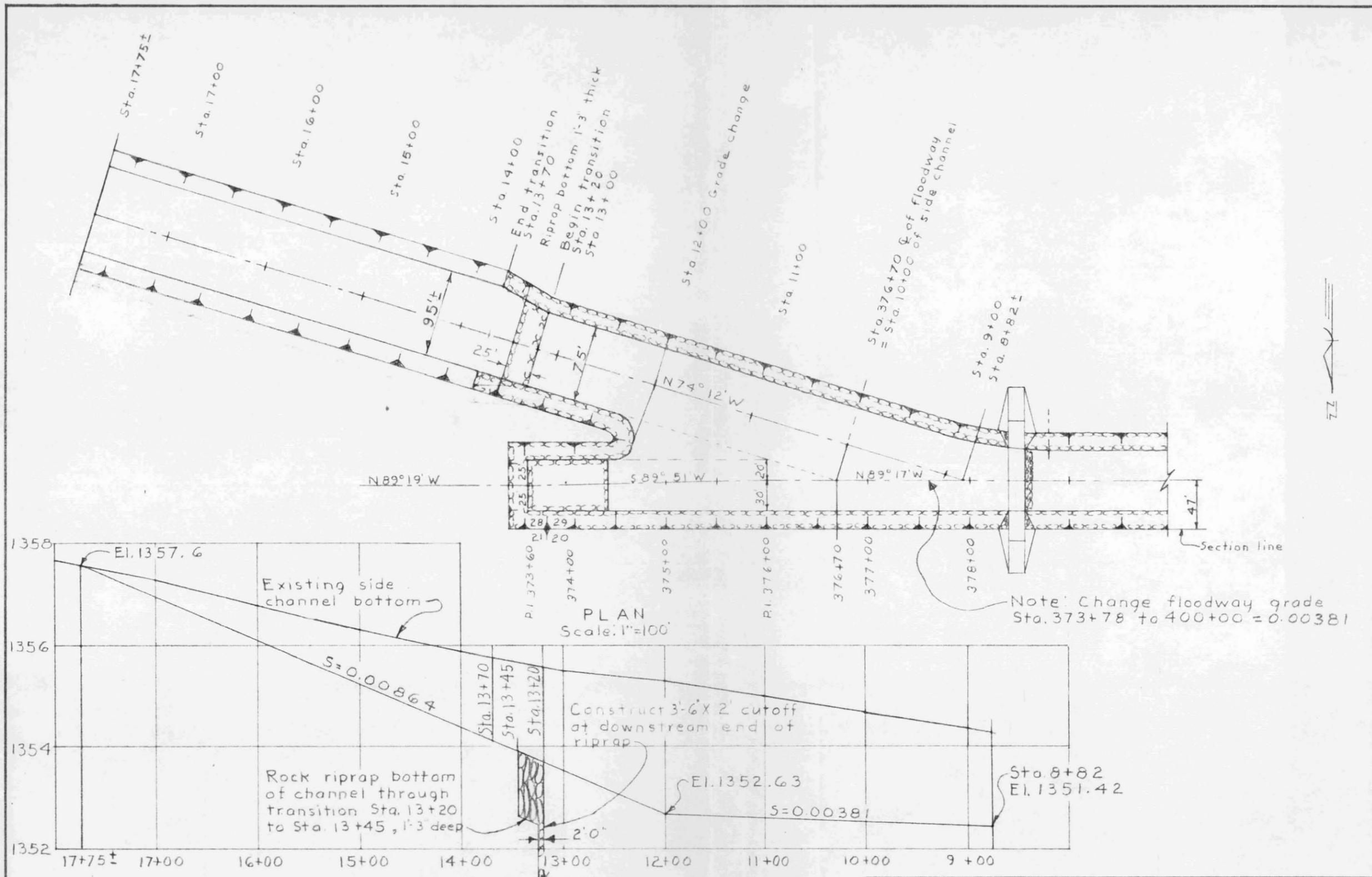


SECTION G-G POWERLINE FLOODWAY

DETAILS OF WEIR INLET STA. 371+80



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DATE: 6-8-67	SHEET 23 b OF 44



PROFILE OF SIDE CHANNEL
POWERLINE FLOODWAY

U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	
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CHECKED BY R. Arrington	DRAWING NO. 7-E-20598
DATE: 6-8-67	SHEET 24 a OF 44

Note: For additional details see sheet 24 (original)