



**Construction progress report prepared by William Rea Holway of
Holway and Neuffer Consulting Engineers of Tulsa, OK, to the board
members of the Grand River Dam Authority in Vinita, OK, dated
March 6, 1939**

**Museum of Tulsa History
Catalog Number: 1969.001.048**

Notice of Copyright:

Published and unpublished materials may be protected by Copyright Law (Title 17, U.S. Code). Any copies of published and unpublished materials provided by the Museum of Tulsa History are for research, scholarship, and study purposes only. Use of certain published materials and manuscripts is restricted by law, by reason of their origin, or by donor agreement. For the protection of its holdings, the Museum of Tulsa History also reserves the right to restrict the use of unprocessed materials, or books and documents of exceptional value and fragility. Use of any material is subject to the approval of the Curator.

Citing this Resource:

The preferred citation for this manuscript resource is the following:
Construction progress report prepared by William Rea Holway of Holway and
Neuffer Consulting Engineers of Tulsa, OK, to the board members of the Grand
River Dam Authority in Vinita, OK, dated March 6, 1939, [1969.001.048], William
Rea Holway Collection, Museum of Tulsa History, Tulsa, OK.

HOLWAY AND NEUFFER
Consulting Engineers
TULSA & ALBUQUERQUE

W. R. HOLWAY
H. C. NEUFFER

E. L. Chandler

MAR 6 - 1939

Vinita, Oklahoma
March 6, 1939

Grand River Project - Pensacola Dam
PWA Docket No. Okla. 1097 - P-DS

ENGINEERS' PROGRESS REPORT #13

Board of Directors
Grand River Dam Authority
Vinita, Oklahoma

Gentlemen:

We herewith submit our monthly report on the engineering and construction features of the Grand River Project, reporting progress since our report of February 3, 1939.

(Contracts 1, 2, 3, and 4 completed).

Contract 5. Hydraulic Turbines. Allis-Chalmers Mfg. Co.

The manufacture of the turbines is proceeding according to schedule and final drawings have been received by us. The first shipment will be ready on March 10th and will consist of the 750-HP unit and 36" valve and the 15' butterfly valve for the first 20,000-HP unit.

Contract 6. Electric Generators. Westinghouse Mfg. Co.

Work on this contract is proceeding according to schedule and the latest of two reports received this month is hereto attached. Mr. Dibble, our consulting engineer on electrical matters, will visit the Westinghouse plant in Pittsburgh this week to inspect the work already done.

Contract 7. Dam and Power House. Massman Construction Co.

Excavation. The switchyard grading is practically complete. The cable tunnel and elevator shaft are progressing well; the pilot heading is carried into the west bluff for the full length of the tunnel and a 4' x 4' shaft is completed to the surface and is now being enlarged by working down from the top. A compressed-air plant has been set up for use on this work and for later service in the second cofferdam. Excavation for Buttress #1 is complete.

The trench excavation in the arch section of the dam is progressing at a good rate with footings practically completed from #6 to #25 going east and mass excavation going west from #52 to #46. Rock excavation in the gravity spillway and non-overflow sections and in the east spillways is complete.

The grading for the highways at either end of the dam is nearly done and the pilot trench along the east side of the main spillway channel is finished. A channel is being excavated downstream from the No. 2 East Spillway and a levee built along the Delaware County line to prevent water overflowing on lands not to be acquired by the Authority.

Cofferdams. The Contractor is starting preparations for building his second cofferdam to enclose the west end of the dam and the power house area. Buttress #6 will serve as the west end of the first cofferdam while the work is progressing on the second cofferdam and later will serve as the east end of Cofferdam #2 when water is turned through the section of the dam now being built in Cofferdam #1.

Aggregate. Sand which meets the specifications is being produced at the Muskogee sand plant by the addition of fine materials hauled to the job and the wasting of a large quantity of intermediate sizes. The Contractor has informed us that he is purchasing a classifier which will make this production of satisfactory sand more expeditious and efficient. Except for a short delay during extreme cold weather, the plant has been furnishing a sufficient quantity of sand for the present operations.

At the Whitebird Quarry the two new gasoline engines have been working satisfactorily and the plant has been producing more in quantity than is being used on the work at present. Further modifications will have to be made in the grading of the large sizes of rock. It is hoped that the development of a larger face in the quarry will make it possible to produce in sufficient quantities to meet the maximum requirements of the work. If not, the Contractor will be ordered to put in additional equipment in the near future. Transportation of the aggregate by way of the K.O. & G. R.R. is working out satisfactorily.

Concrete. Approximately 14,600 cubic yards of concrete have been poured to date. During the month of February there were some seven or eight days of inclement weather and three days when it was too cold to pour. ✓ Four days were lost while the conveyor plant was being connected to the mixer. One breakdown of the mixing plant and no spare parts on hand stopped pouring for a day and a half, but during that time a needed change in the plant was made. The carpenter and pouring crews are not as efficient as further experience will make them; a lack of a sufficient number of suitable vibrators has been a cause of slow progress. ✓

The mixing plant and conveyor system are now working satisfactorily. The Contractor is responding to our requests for more men and equipment by adding them. This month should see a marked increase in the rate of pouring concrete since the gravity section is now almost completely available for this work.

The buttress footings have been poured from #6 to #15 and arch footings from #6 to #13. Parts of the walls have been poured on Buttresses #6 to #11, inclusive. In the main spillway section two blocks have been poured. *8 apron*

Grouting. In the present cofferdam area the grouting of foundations has been begun in advance of changing the cofferdams. The Contractor has secured the services of an expert to do this work, a man who has had a great deal of experience on similar work on large dams, including Boulder Dam. ✓

Equipment. One large whirley crane has been assembled and moved to the spillway section to be used in placing concrete there, as well as the whirley formerly used in handling the materials for early concreting. Another new whirley has arrived on the cars; two others are on the way. Grouting equipment and a new Northwest crane have also been added, besides the compressed-air plant, hoist, and drill working on the switchyard site.

Contract 8. Grove Highway Bridge. S. E. Evans

Progress on this contract continues to be highly satisfactory. The Contractor has added to his equipment a new Northwest crane with a 100-foot boom to pour the upper lifts of the piers. A second set of plywood forms has also been delivered to the site. Excavations for the piers are complete for Piers #4 to #14 and #16 is also finished, leaving only four more to be excavated. Earth excavation is complete on all of the six bents at the north end of the bridge.

Footings have been poured on Piers #4 to #14, inclusive; shafts - six feet on Piers #4 and #5 in the river, 42 feet on Pier shaft #10, and 52 feet on each of 6, 7, 8, and 9.

A good amount of materials are on hand at this job. The work in the river on Pier #3 is to start immediately.

Contract 9. Frisco Railroad - Track Elevation. Leo Sanders

The excavation is complete and pier footings have been poured on bridge Piers #3 to #10, inclusive, leaving only one main pier to excavate and pour. This cannot be done at this time because the Authority has not obtained possession of the property on the east bank of the river. ✓ The concrete piles for Pier #11 and the west abutment have all been made and four of those for Pier #11 have been driven.

Grading for the passing track elevation is complete, ties are being placed, and the piling for one of the trestles is being driven. The culvert pipe has been received and installed. Very little earth work has been done on this contract because of the fact that the Authority has not obtained possession of enough of the right-of-way to make a continuous operation.

Unless the Authority succeeds in modifying the order for the license from the Federal Power Commission it will be necessary to raise the elevation of the Frisco Bridge 1.3 feet and necessary to raise the fill from Elev 750 to Elev 760. If the bridge is raised the Frisco Railroad will demand a more expensive structure at each end of the bridge. Their engineers, together with ours, have been working on a possible location from the bridge west in order that a fill to Elev 760 might be built more cheaply, if it is going to be necessary to raise this line. In order not to delay the work in the river with a consequent possible damage suit, we have raised the pier footings 1.3 feet so that the bridge may be raised during construction rather than with a much greater expense at a later date. Before your next meeting we hope to be able to make a recommendation as to whether or not we should revise the bridge ends to take care of the possible higher level. All work has been stopped on the pile footings for the abutments and first piers, pending this decision. ✓

The Contractor has made as rapid progress as could be asked for under the existing conditions.

Contract 10. K.O. & G. R.R. Relocation. M. E. Gillioz, Inc.

Embankment is mostly complete between the south end of the relocation and Highway 59. Excavation for the fifteen culverts is complete except for #9 and #10, and the footings have been poured on nine and seven are entirely finished.

On Horse Creek Bridge the pier footings for the first seven piers have been completely excavated and the Contractor is working on #8 and #9. Progress on the excavation for the bridge footings has been slowed down due to the unsatisfactory and erratic character of the rock near the surface. The preliminary drilling of this site did not give a true picture of the rock, due to the vertical clay seams and open caverns. ✓ Foundations have been carried several feet deeper than was anticipated because of these characteristics of the rock. It is expected that the foundations across the river and on the other end will be much better.

The footings of the first seven piers have been poured; the south abutment and Pier #1 have been completely poured and stripped; Pier #3 will have the bent completed today. #5 is half finished, and #4 is being formed.

The Contractor on this work is making satisfactory progress.

Contract 11-A. Dewey T. Ross Engineering Corporation.
Approximately 800 acres have been felled, and 150 acres
piled and disposed of.

Contract 12. Power House Auxiliaries and Switchyard

Preliminary work on this contract has proceeded in a very satisfactory manner. Several conferences have been held with the representatives of the Contractor and of the various companies furnishing equipment or subcontracting parts of the work. The major part of the equipment has been approved and minor details adjusted. The greater part of the electrical equipment is to be furnished by the General Electric Company. You have before you requests for permission to subcontract the Transformer Service Hoist installation and the Elevator. You have approved E. R. Brenner Company of Kalamazoo, Michigan, to do the construction work on the Relay House, the cable tunnel, and various switchyard structures. Final drawings are now being submitted and examined.

The superintendents of the Brooker and the Brenner companies are on the job. The railroad siding in Langley is completed and the Contractor's office finished. He is ready to proceed with the concrete work as soon as the blasting for the tunnel and shaft is completed under Contract 7.

On February 14th five bids, all under the engineers' estimate of cost, were received by you, and the contract was awarded to the Federal Engineering and Construction Company of Kansas City, Mo., at the contract price of \$256,737.90. This company is now making bond and preparing to execute their contract.

The schedule of contracts calls for the contract documents for the removal of cemeteries being submitted to you on February 28th. On that date we reported to you that we believed this matter should be handled by the Land Department on force account basis, rather than by taking bids and letting of contracts. This matter was referred to a committee consisting of Mr. Wright, Mr. Newman, and W. R. Holway. This committee has had one meeting and should have a report ready for your next meeting.

The schedule of contracts called for presenting documents to you today for the building of the new waterworks plants for Grove and Vinita to replace the ones to be flooded by the reservoir. The documents are practically ready, but we have not yet reached an agreement with the Public Service Company who is the owner of the Grove Waterworks system. We have prepared the documents to include both of these jobs in one contract. If there is to be any delay in getting approval from the Public Service Company, we will prepare the Vinita work as a separate contract and present it to you at an early date.

Conference was held this last week with the Shell Pipeline Company representatives relative to the relocation of their lines and a conference is scheduled this week with the Southwestern Bell Telephone Company. The Ajax Pipeline Company and the Public Service Company have not yet completed their studies for relocation.

Surveying and Mapping.

The surveying and establishing of the 750 severance line around the reservoir area is practically complete. The office work is proceeding rapidly to complete this part of the work.

Miscellaneous.

The electrical design division of our engineering force has been moved from Tulsa to the Vinita Office and the Structural Design Division to the Field Office. Mr. Lee Hendrix, who has been Chief Structural Designer, has been named as Mr. Chandler's Principal Assistant. Additional inspectors and engineers have been moved on to all contracts as the work has been accelerated.

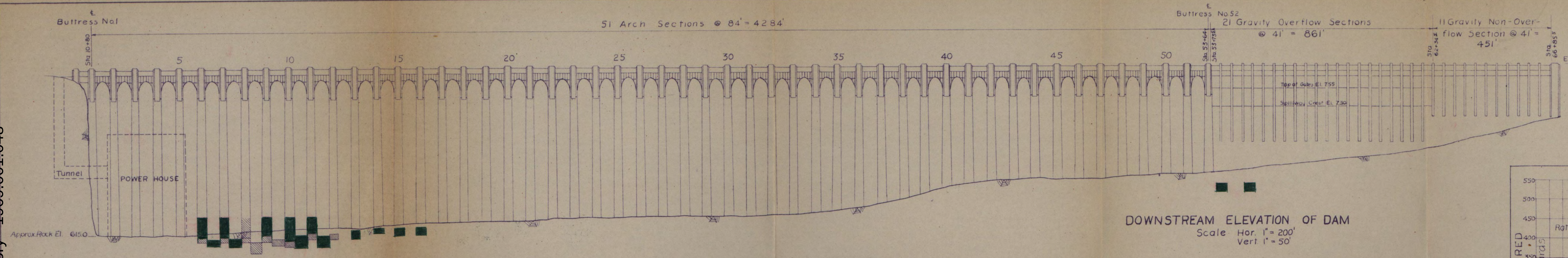
Respectfully submitted,

HOLWAY and NEUFFER, Engineers

By _____

W. R. Holway





LEGEND

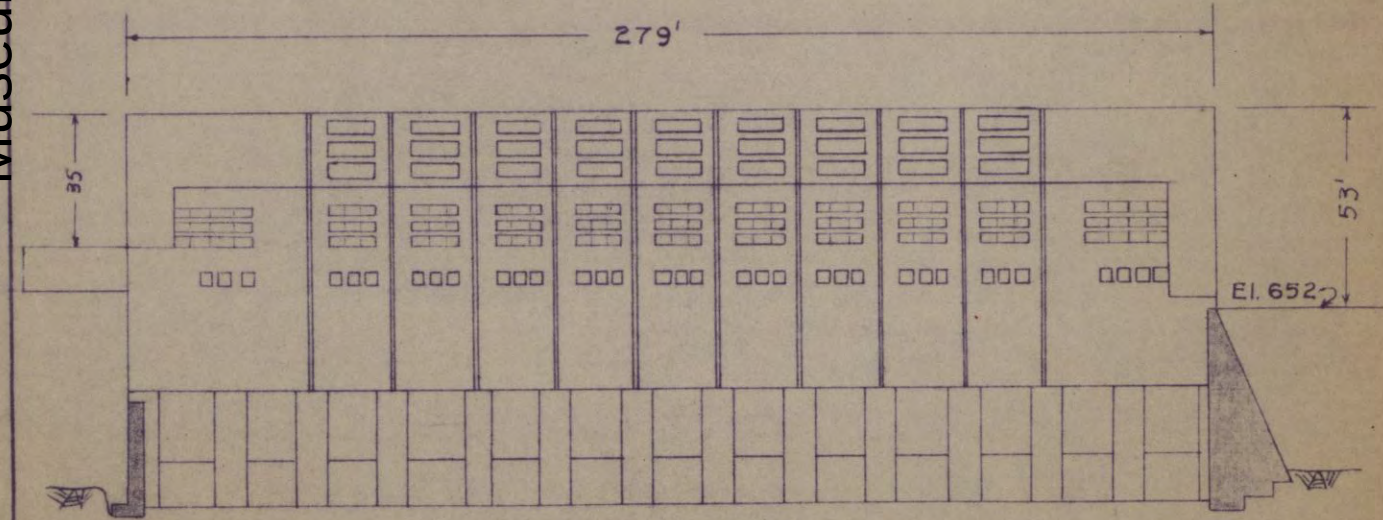
Concrete poured during current month GREEN

Concrete poured during previous months

DOWNSTREAM ELEVATION OF DAM

Scale Hor. 1" = 200'

Vert 1" = 50'

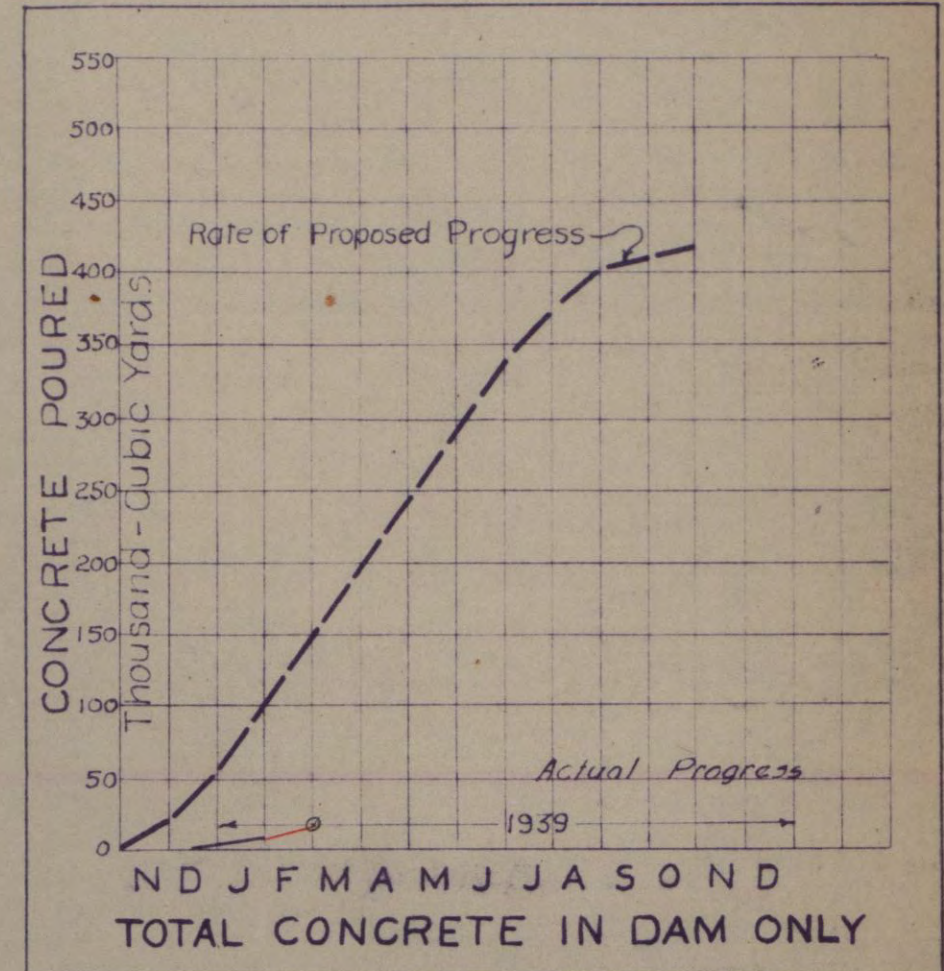
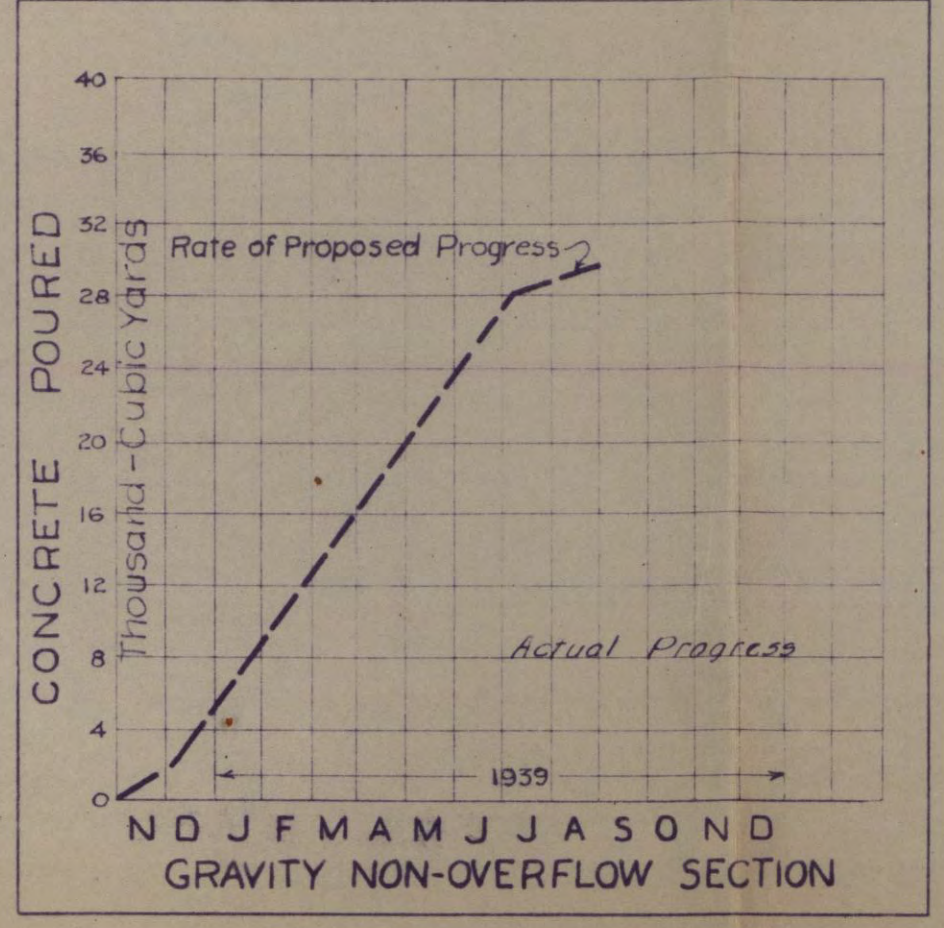
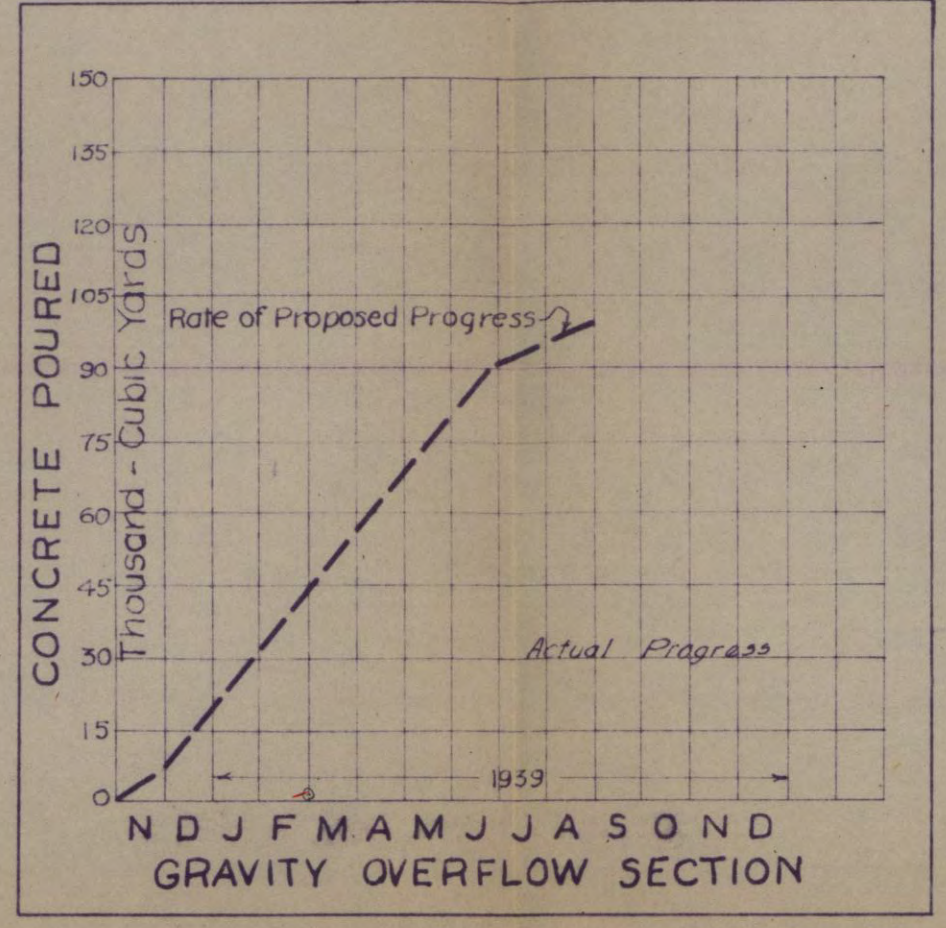
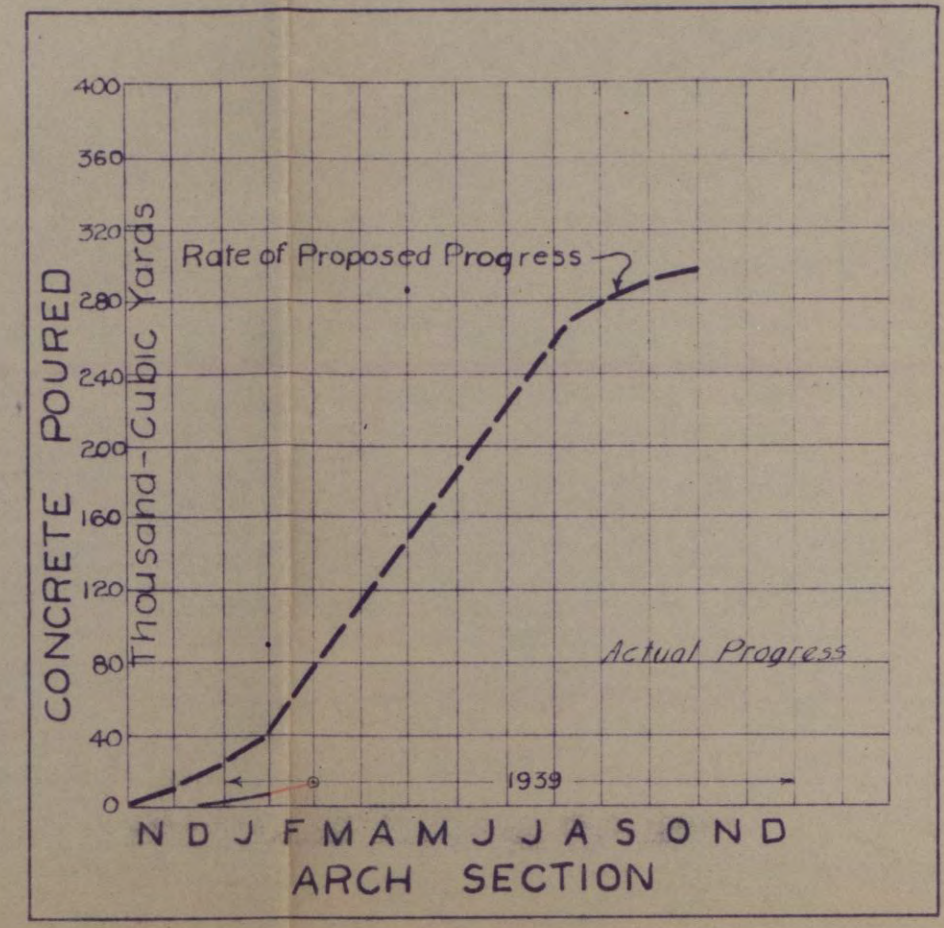
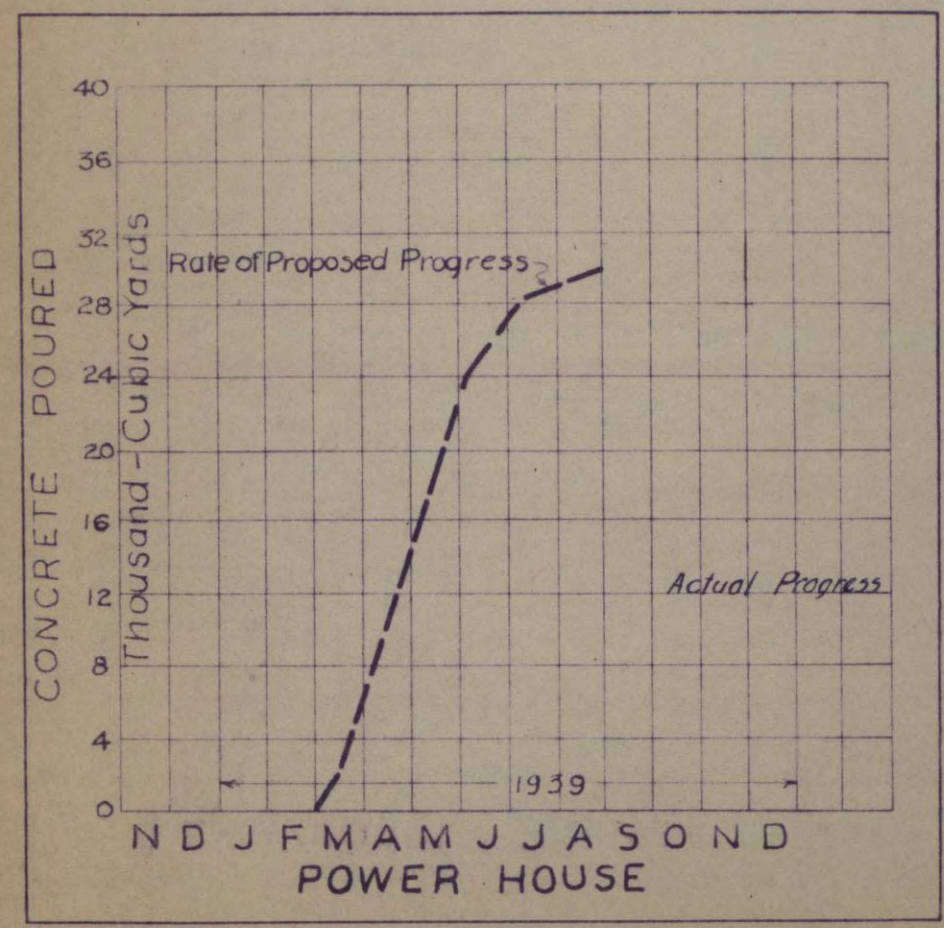


POWER HOUSE

Scale 1" = 50'

DRAWN BY *A. J. Fornelli* DATE 12-22-38

APPROVED BY *J. L. Chaudier* 12-26-38



GRAND RIVER PROJECT

PENSACOLA DAM

CONTRACT 7-DAM & POWER HOUSE

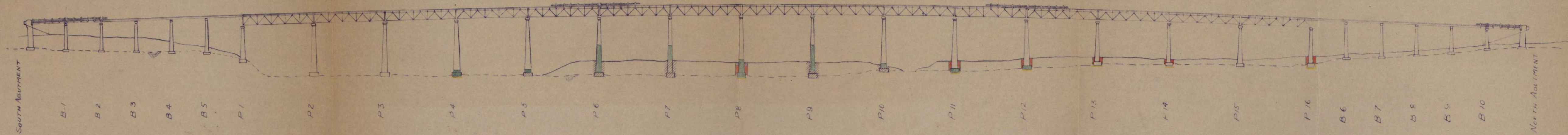
CONCRETE PROGRESS DIAGRAM
THRU FEBRUARY 28, 1939

SCALE As Shown DWG. NO. FI-8R1

GRAND RIVER DAM AUTHORITY

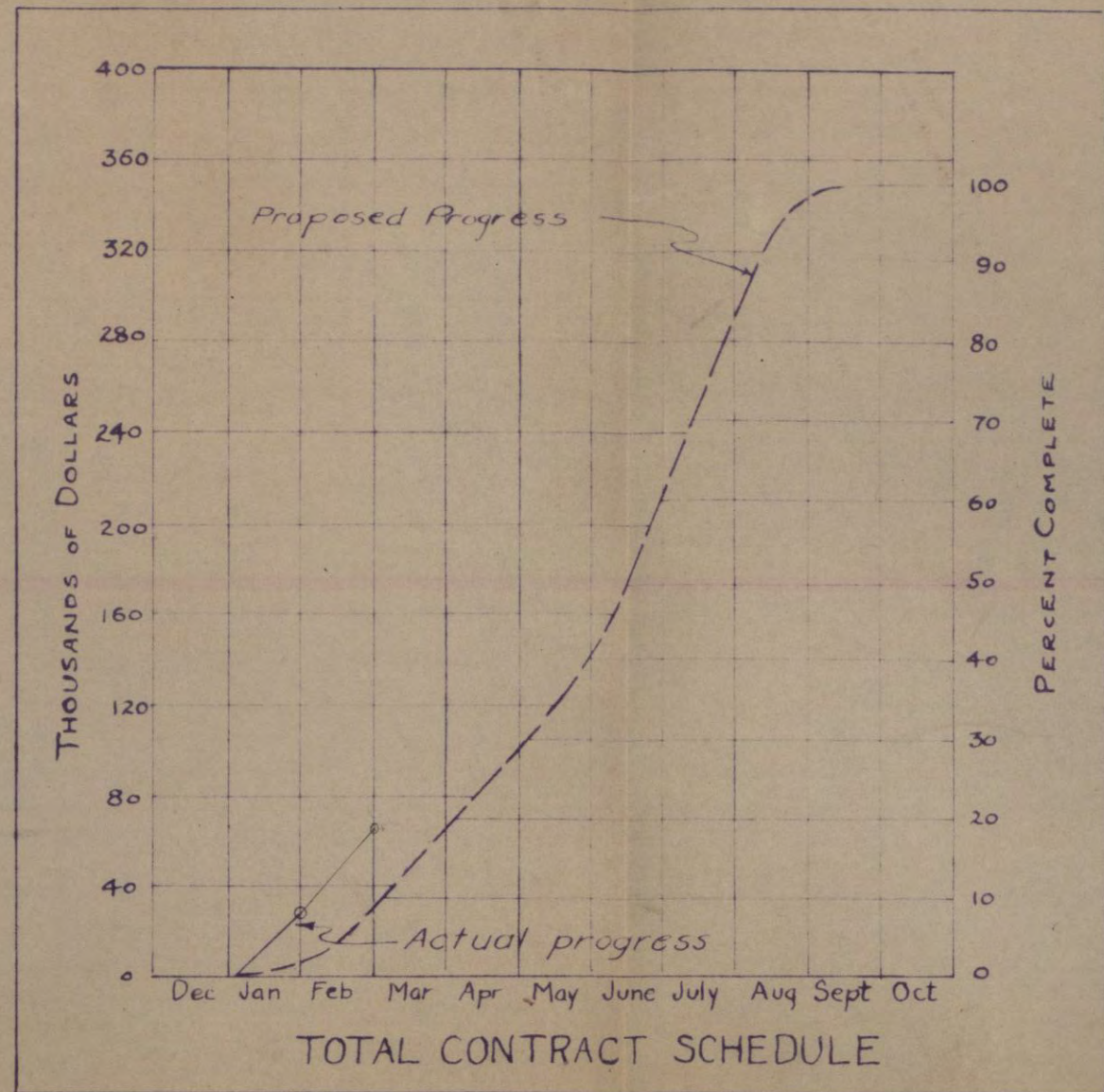
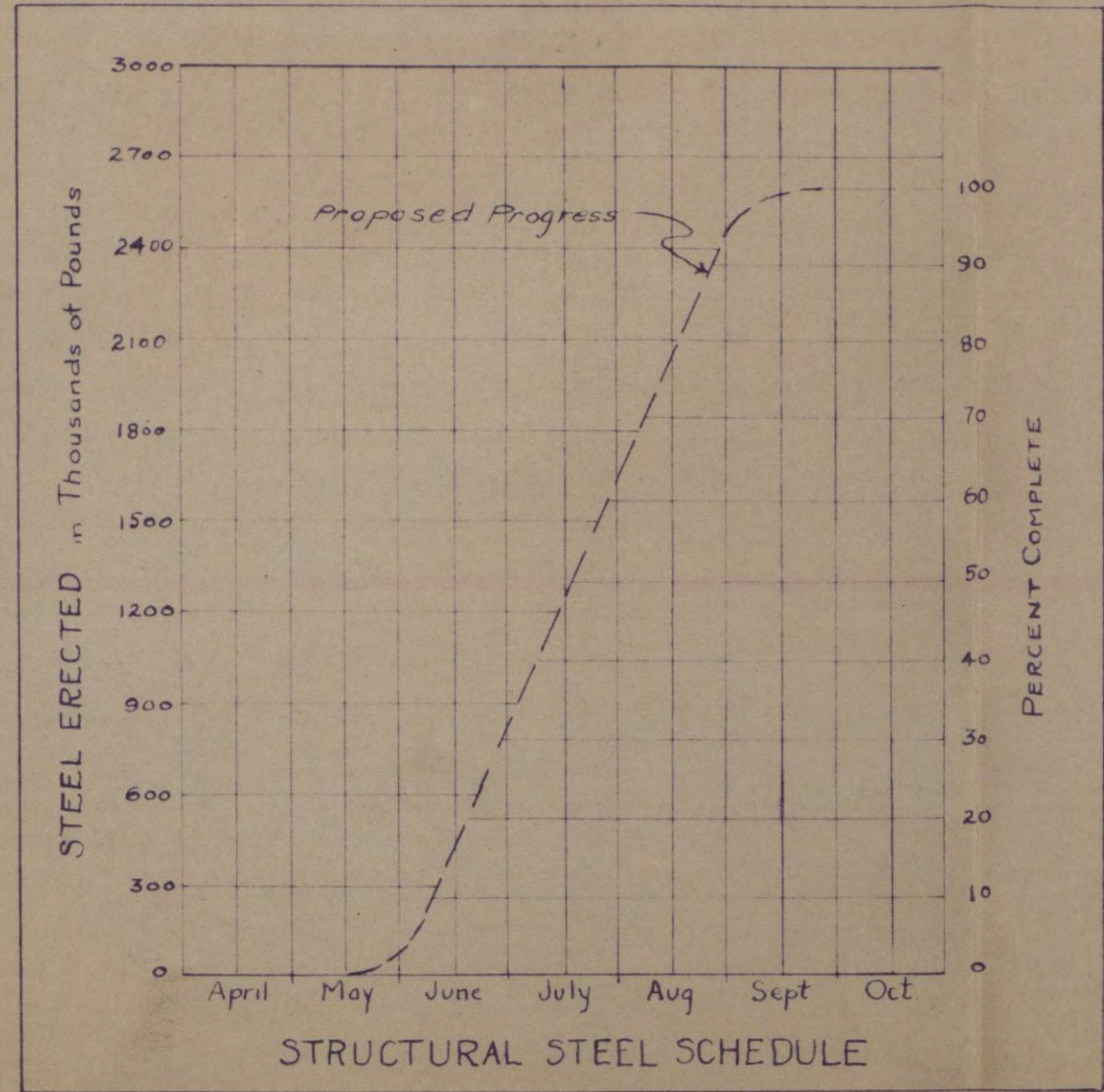
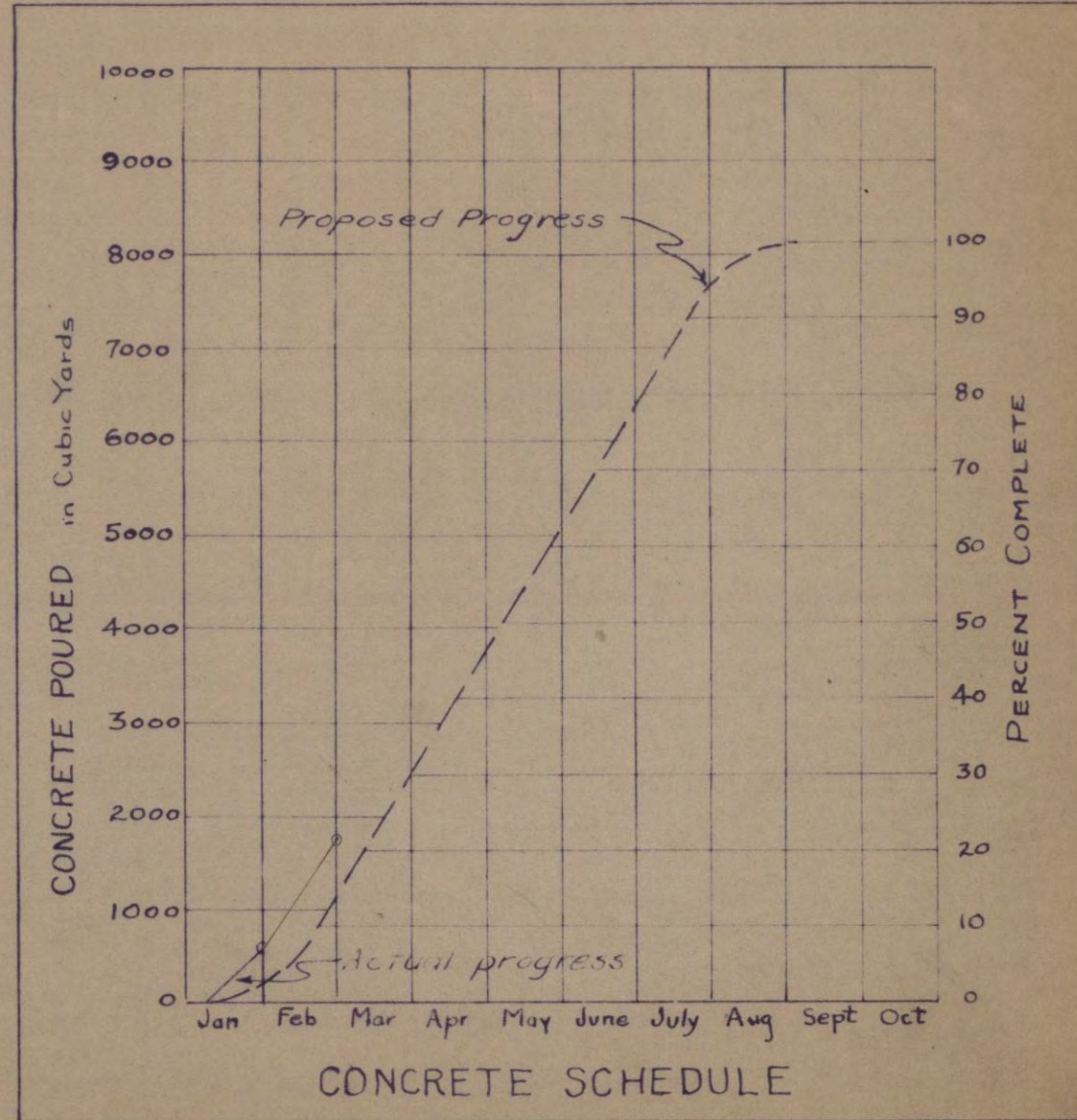
HOLWAY & NEUFFER - ENGINEERS

RI Color designation changed

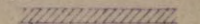


UPSTREAM ELEVATION OF GROVE HIGHWAY BRIDGE

SCALE: 1 INCH = 100 FEET



~ LEGEND ~

Work completed previously shown 

Work completed this month shown by color

Earth excavation	Red
Rock excavation	Yellow
Concrete	Green
Structural Steel	Brown
Other items	Orange

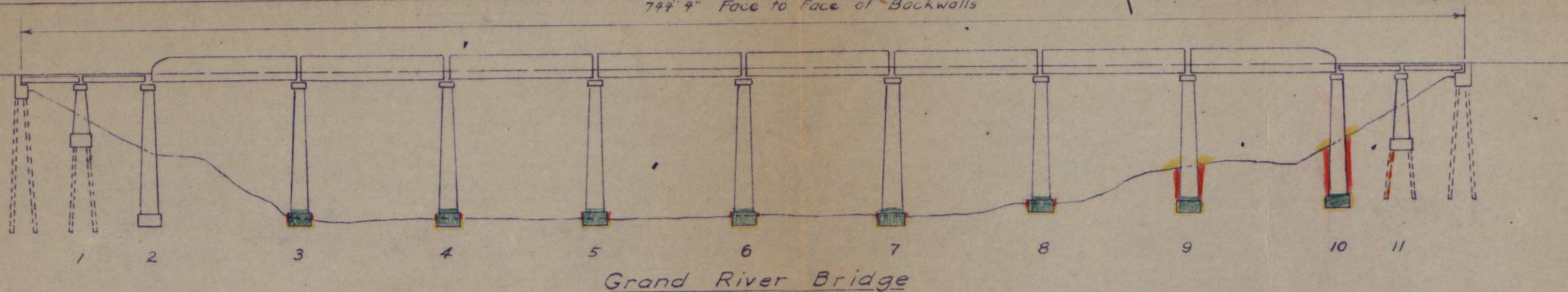
F.H. OAKLEY, RES. ENGR.

GRAND RIVER PROJECT
PENSACOLA DAM
CONTRACT 8 - GROVE HIGHWAY BRIDGE
PROGRESS DIAGRAMS
THRU FEBRUARY 28, 1939
SCALE AS SHOWN DWG. NO. FI-10R1
GRAND RIVER DAM AUTHORITY
HOLWAY & NEUFFER - ENGINEERS

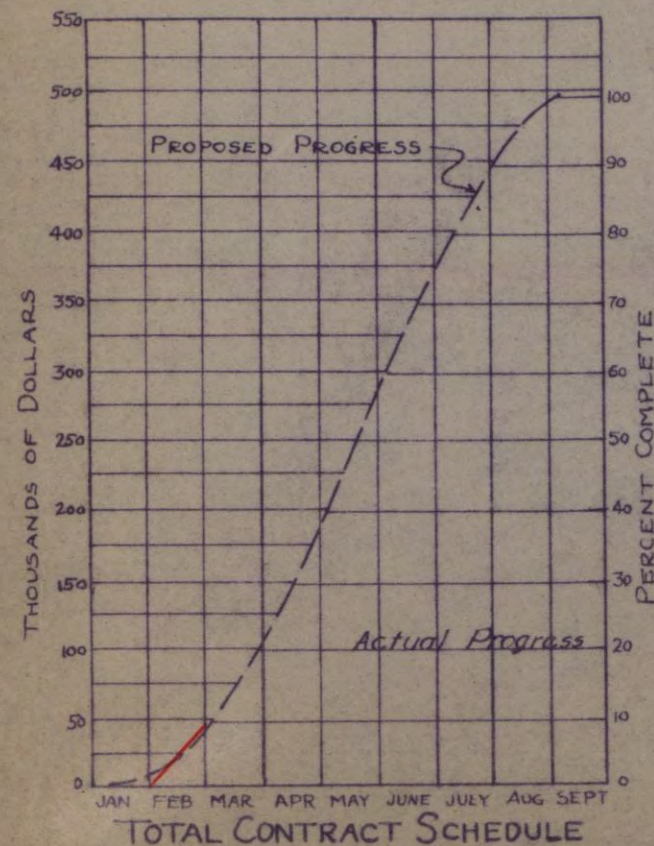
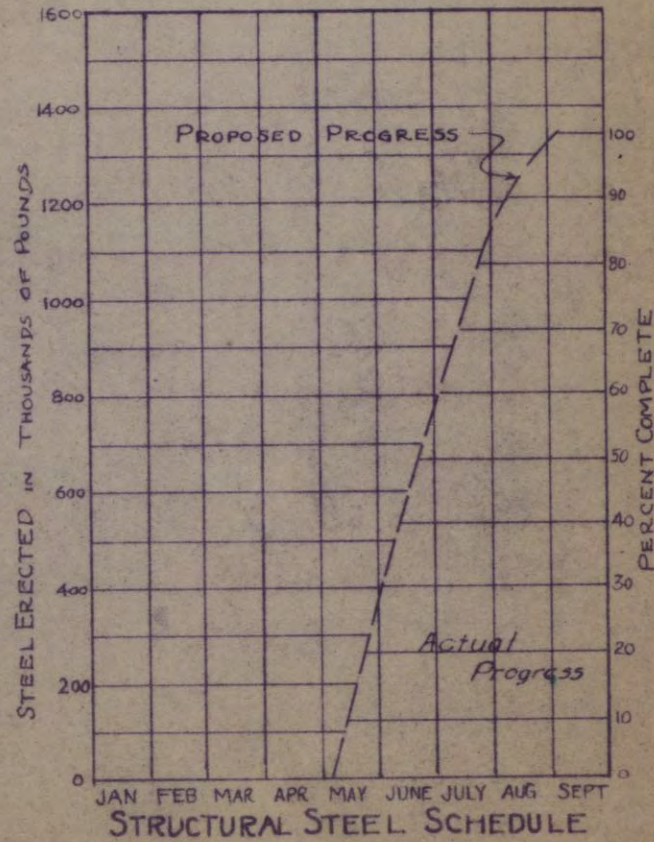
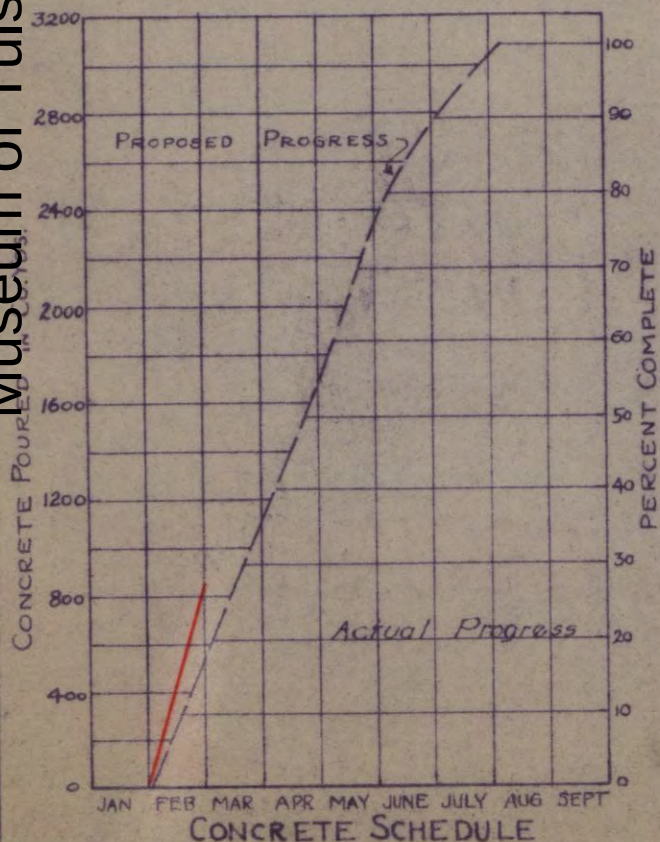
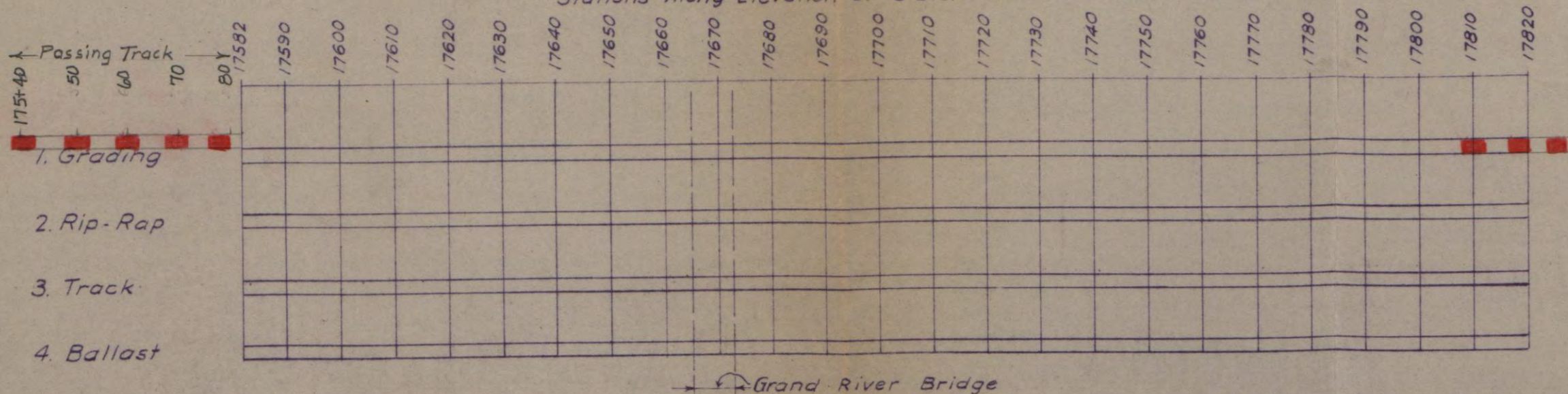
Drawn by: E.F. Biddle DATE: 12-26-38
Approved by: E.L. Chandler " 12-26-38

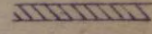
RI Legend changed

744' 4" Face to Face of Backwalls



Stations Along Elevation of S.L.S.F.R.R.



— LEGEND —
Work previously done shown: 
Work done this month shown by color
Earth excavation — Red
Rock excavation — Yellow
Concrete — Green
Structural Steel — Brown
Other items — Orange
Broken lines or partial circles indicate partial completion

W. D. Harkins, Res. Engr.

GRAND RIVER PROJECT

PENSACOLA DAM

CONTRACT 9-FRISCO R.R.-TRACK ELEVATION

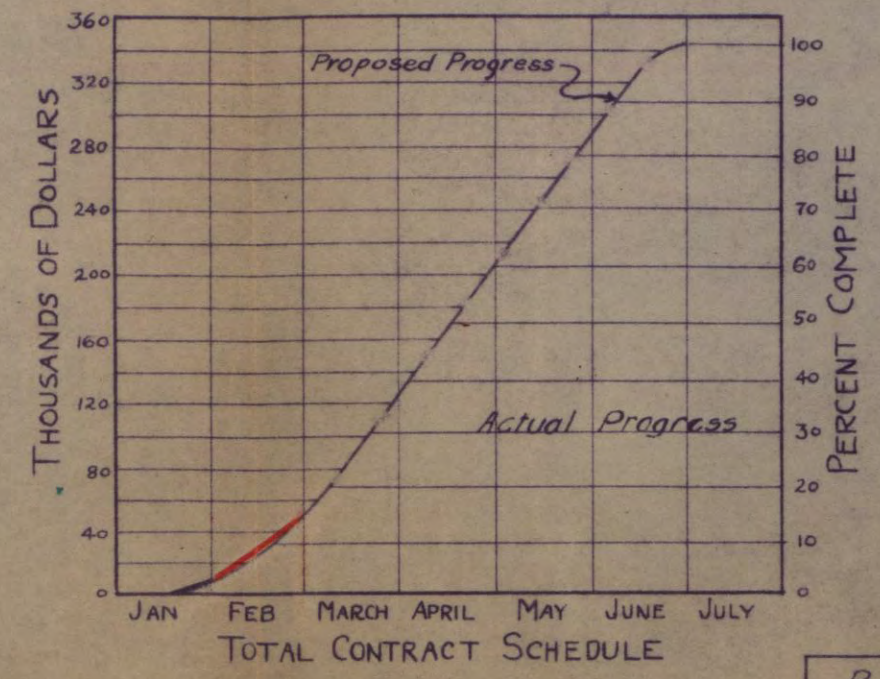
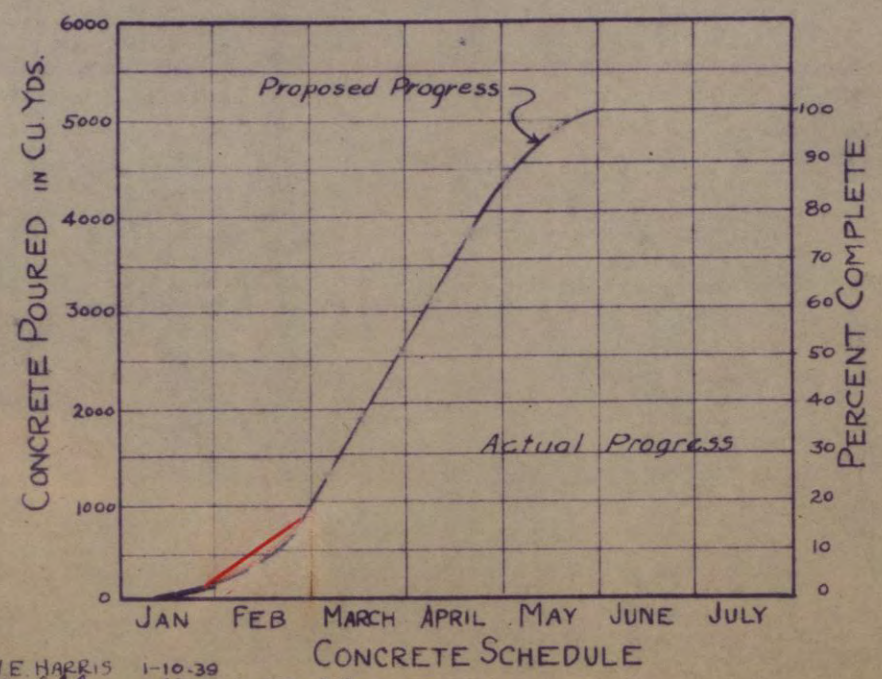
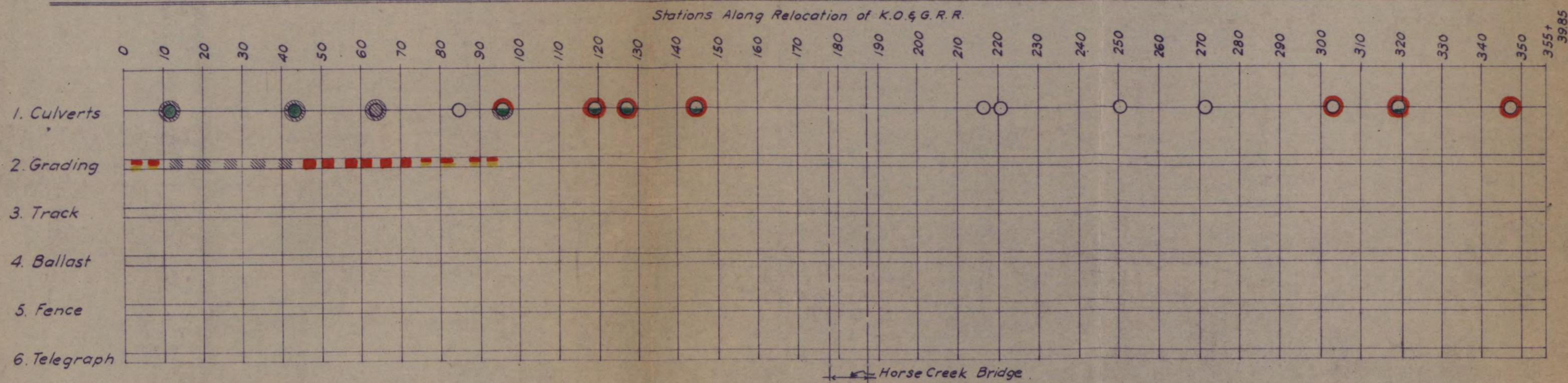
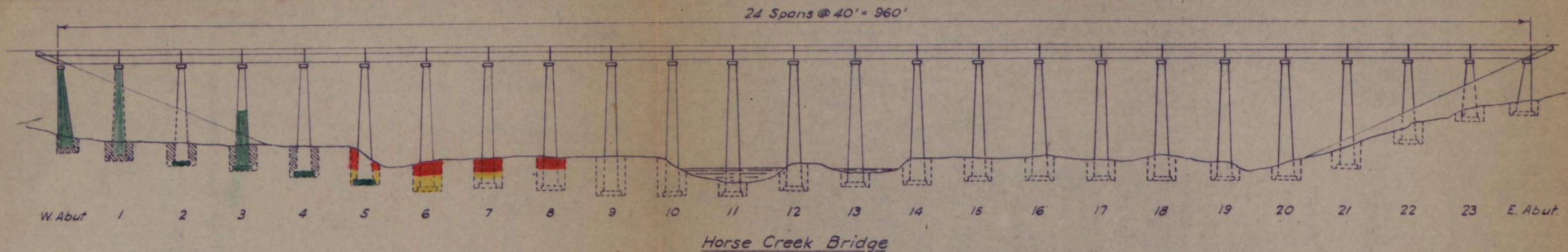
PROGRESS DIAGRAMS

THRU FEBRUARY 28, 1939

SCALE AS SHOWN DWG. NO. F 1 - 18 R 0

GRAND RIVER DAM AUTHORITY
HOLWAY & NEUFFER - ENGINEERS.

DRAWN BY: W.E. Harris 1-15-39
APPROVED BY: J. S. Hawthorne 2-17-39



~ LEGEND ~

Work completed previously shown:

Work completed this month shown by color

Earth Exc. ~ Red

Rock Exc. ~ Yellow

Concrete ~ Green

Other items ~ Orange

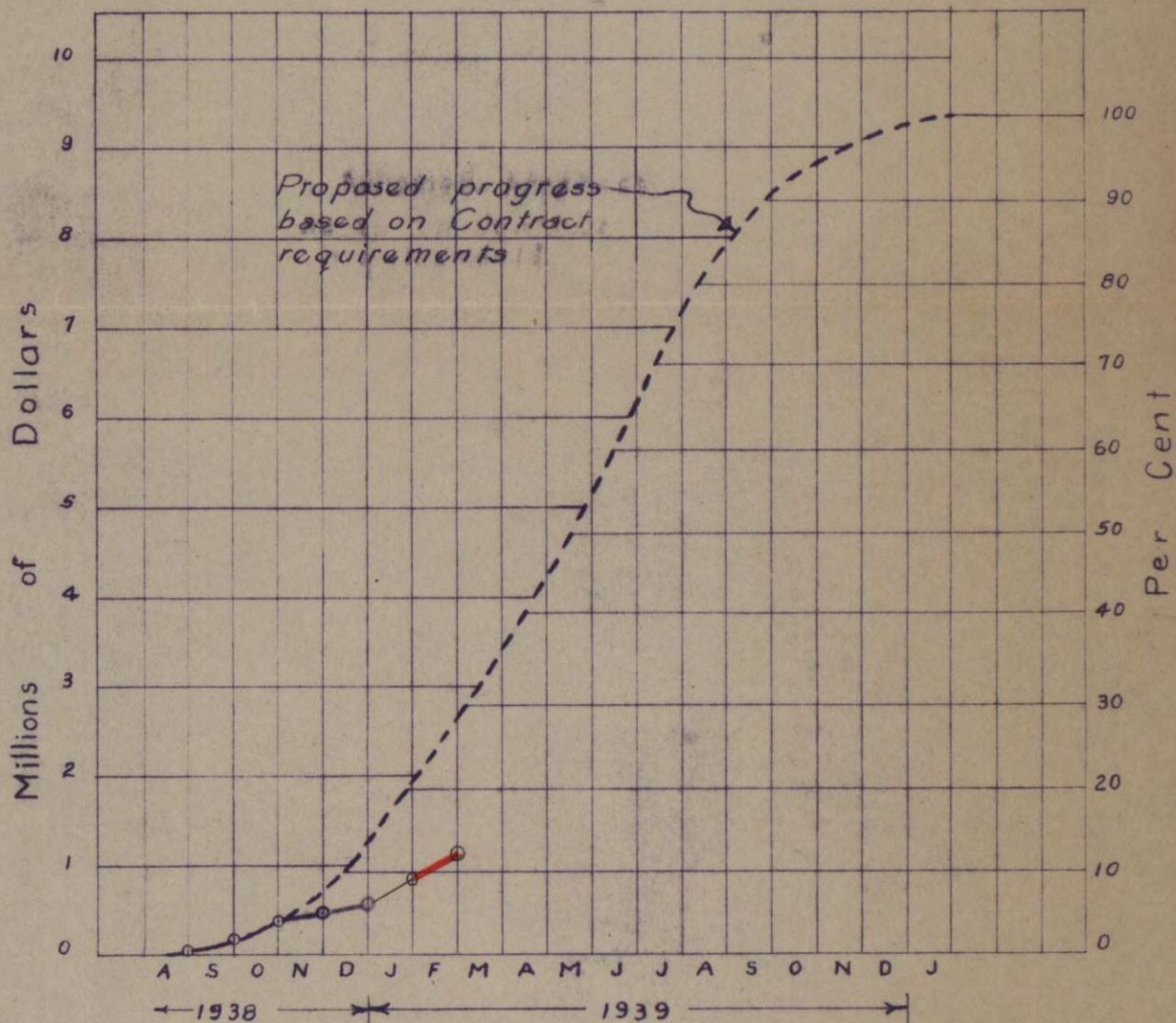
Broken lines or partial circles indicate partial completion

R.W. Fox, Res. Engr.

DRAWN BY: W.E. HARRIS 1-10-39
APPROVED BY: 1-23-39

GRAND RIVER PROJECT
PENSACOLA DAM
CONTRACT 10-KO & G. R.R. RELOCATION
PROGRESS DIAGRAMS
THRU FEBRUARY 28, 1939
SCALE: AS SHOWN DWG. NO. F1-17 R1
GRAND RIVER DAM AUTHORITY
HOLWAY & NEUFFER - ENGINEERS

R1 Legend changed



LEGEND
 Proposed Progress ---
 Actual Progress ○—○—○

GRAND RIVER PROJECT	
PENSACOLA DAM	
CONTRACT 7-DAM & POWER HOUSE	
GENERAL PROGRESS DIAGRAM	
SCALE AS SHOWN	DWG. NO. FI-3R0
GRAND RIVER DAM AUTHORITY	
HOLWAY & NEUFFER - ENGINEERS	

DRAWN BY A. G. Morgan
 TRACED BY A. G. Morgan
 APPROVED BY E. R. Chandler

