ORANGE COUNTY FLOOD CONTROL DISTRICT

PERMIT

1. PERMIT DATA

PERMITTEE: City of Huntington Beach
P. O. Box 190
Huntington Beach, California

DISTRICT PROJECT: East Garden Grove-Wintersburg Channel

R/W CLASSIFICATION: "A" & "E"

PERMIT NUMBER: 05767

EFFECTIVE DATE: MAY 31 1967

EXPIRATION DATE: See Provision A

COS 126 74

2. PERMITTED USE

The Orange County Flood Control District hereby grants permission to permittee to do the following, subject to provisions on reverse hereof:

To widen the existing Warner Avenue and Golden West Street bridges over district's East Garden Grove - Wintersburg Channel as shown on permittee's improvement plans.

Warner ave & Goldenwest

3. PERMITTEE'S ACCEPTANCE

Permittee accepts permit and agrees to comply with and be bound by the terms thereof.

_____
PERMITTEE

4. REVIEW BY COUNTY COUNSEL

Approved as to form:

James L. Okazaki
ASSISTANT County Counsel

5. APPROVAL OF PERMIT

A. Approved by Board of Supervisors of Orange County Flood Control District by order made and entered

APPROVED BY BOARD OF SUPERVISORS
MAY 31 1967
DATE

_____.

Attest_____ _____
CLERK DATE

_____
CHAIRMAN, BOARD OF SUPERVISORS

B. Approved by Chief Engineer pursuant to authority delegated by Board of Supervisors by Resolution

No._____ adopted_____.

_____ _____
DATE CHIEF ENGINEER

500

ORANGE COUNTY FLOOD CONTROL DISTRICT

SPECIAL PROVISIONS

05767
Permit No.

A. This permit shall expire upon the completion of the permitted work and the granting of permanent easements for street purposes. Upon the completion of the proposed work and filing of a Completion Report by district's inspector district shall then convey to the City of Huntington Beach easements for street purposes pursuant to legal descriptions to be provided by permittee.

B. Permittee agrees to provide the contractor or construction foreman on the job site a copy of the permit and a complete set of plans stamped with flood control district approval.

The permitted work which includes the widening of the existing bridges, reconstruction of fencing and gates, construction of roadway approaches, relocation of existing utilities and other related work shall be in accordance with approved plans on file in district's office and shall be subject to control and inspection by district's duly assigned inspector.

C. Permittee acknowledges the responsibility for the structural design and integrity of the proposed bridges and agrees to provide for the maintenance of the street crossings to be improved under the terms of this permit. District shall be responsible for maintenance and operation of the waterway, fencing and gates.

Permittee recognizes the fact that the proposed construction is in a location of unstable soil conditions and permittee agrees to hold the district harmless from any damage to the proposed construction as a result of said soil conditions and agrees to repair said damages.

D. No work shall be performed within district's right of way without the full knowledge of district's inspector, who shall be given not less than 24-hours advance notice of the initiation of the work either by telephone (534-0336) or by mail addressed to 13872 East Garden Grove Boulevard, Orange, California.

E. Permittee shall be responsible for providing required surveys and necessary lines and grades for the proposed construction work. District shall then check the lines and grades within 48-hours of notification and permittee agrees that no construction will commence until district's inspector has certified that the lines and grades are satisfactory.

ORANGE COUNTY FLOOD CONTROL DISTRICT

SPECIAL PROVISIONS

05767
Permit No.

F. Permittee acknowledges that no construction within the channel will be permitted between the dates of October 15 and April 15 except as specifically approved by district's inspector. District requirements and field inspection shall in no way relieve permittee or the contractor of the responsibility for providing for the free flow of storm runoff in the district's channel during the construction period, and permittee agrees to assume all liability for any damage that may be caused by contractor's failure to provide for the free flow of storm runoff.

G. Permittee agrees to be responsible for the contractor's securing of public liability and property damage insurance in an appropriate amount in which the Orange County Flood Control District shall be named as joint assured with permittee.

H. All excavations to be backfilled shall be compacted to a relative density of at least 90% of the maximum density as specified in California Test Method No. 216.

I. This permit shall become void in the event the use permitted is abandoned for a period exceeding one year.

City of Huntington Beach
P.O. BOX 190 CALIFORNIA 92648

May 12, 1969

COPY

A. S. Koch
Orange County Road Department
400 West Eighth Street
Santa Ana, California

Attention: W. L. Zaun

Subject: Springdale Bridge at C05 Channel
CC-083 A.H.F.P. #435

Dear Mr. Koch:

Reference is made to your letter of May 6 recommending various items to be included in the subject contract.

It is suggested that you reconsider the recommendations to be incorporated in the plans and specifications. You will recall that we have widened the bridges located in Warner Avenue and Goldenwest Street across the same C05 channel successfully, and feel that we have gained some experience which has been incorporated in these plans and specifications. It is acknowledged that you did not have benefit of reviewing our specifications when you reviewed the plans, therefore, some of the following comments must take that into account. The items which appeared in your letter will be commented on in the same order as follows:

1) Due to the fact that 12" diameter steel pipe has been used successfully in other bridges in this vicinity, it does not seem necessary to go to a larger diameter such as 15".

Secondly, and equally important is the fact that a larger diameter piling would create difficulty in maintaining the pile cap dimensions.

Thirdly, it is a possibility that some time in the future it may be decided to construct concrete piers at the location of the pile bent to accomplish a better hydraulic flow characteristic.

2) We are not opposed to a concrete piling, however, in order to maintain the continuity in appearance it would be preferable to again use steel pipe piling. We are specifying 3/8" thickness on the piling.

3) We prefer to specify the tip elevation on the plans. We are well covered in the specifications if the design elevation cannot be obtained. The specifications regarding this item have been written as follows, "The tip elevations specified are minimum, and shall be obtained unless otherwise permitted in writing by the engineer. If the tip elevations cannot be obtained by driving, and unless new borings are obtained at the contractor's expense which will ascertain that the strata below the tips is of sufficient strength and thickness to support the specified loads, jetting shall be used to secure the tip elevations if directed by the engineer. The piles shall then be redriven to obtain the required blow count."

4) It is felt because of past experience that a pile test in this location is unnecessary and would add to the expense of the contract.

Your review and thought regarding this matter is very much appreciated and we realize that your comments are directed so as to obtain the best possible job. However, we feel we have benefit of local knowledge and extensive experience in the immediate vicinity. It would be appreciated if you would review our comments as quickly as possible and advise us accordingly. It is intended to advertise this project for bidding on June 5, 1969.

Very truly yours,

James R. Wheeler
Director of Public Works

Original signed by H. E. Hartge

H. E. Hartge
City Engineer

JRW:HEH:ae

cc: Orange County Flood Control District

COUNTY OF ORANGE

A. S. KOCH
ROAD COMMISSIONER AND COUNTY SURVEYOR

L. McCONVILLE
ASST. ROAD COMMISSIONER AND SURVEYOR

R. V. WISE
DEPUTY COUNTY SURVEYOR

W.L. ZAUN
DIVISION ENGINEER- OPERATIONS

T.P. O'BRIEN
REFUSE DISPOSAL ENGINEER

M. I. STORM
DIVISION ENGINEER - ENGINEERING

DONIS BARRETT
ADMINISTRATIVE SERVICES OFFICER

TELEPHONE: 834-3456
AREA CODE 714

ROAD DEPARTMENT
ENGINEERING BUILDING
400 WEST 8TH STREET
SANTA ANA, CALIFORNIA 92701

May 6, 1969

Mr. James Wheeler
Director of Public Works
City of Huntington Beach
P. O. Box 190
Huntington Beach, California

Reference: Foundation Review, A.H.F.P. 435.

Dear Sir:

A review of the proposed foundation for the widening of Springdale Street Bridge, A.H.F.P. 435, at the East Garden Grove-Wintersburg Channel, was conducted by reviewing the previous borings near this site. The borings were drilled in 1958 and 1959 for the Orange County Flood Control District. It is recommended that the following items be included in the proposed widening.

1. Piling should be 15 inch diameter, Class I, 45 ton bearing capacity pile in lieu of 12 inch diameter, Class II pile used in the original structure.

2. Alternate Class I piles, as shown on the attached sheet titled "Concrete Pile Details - 45 Ton," are all acceptable foundation pile for this structure and should be considered in lieu of a specific pile type.

3. An estimated tip elevation should be given (i.e., est. tip elevation, 45 feet) in lieu of a specified tip elevation.

4. A pile test should be included in the contract. Attached is a sample pile test specification which allows the testing of the pile or the deletion of the test at the prerogative of the Engineer. The test pile group should have a maximum spacing of 4'-0" on centers and a minimum spacing of 2'-6" on centers with a tolerance of ±3".

The larger diameter pile will provide for higher bearing values than the smaller pile. Summation of blows for the original borings indicate that required bearing values for the 62 ton piles, as indicated on the plans, may not be obtained at the specified tip elevations.

Alternate pile types will allow greater competition among prospective bidders and probably a better price to the contracting agency. Any of the proposed alternates will provide an adequate foundation.

The pile test specification will allow the Engineer to determine if the bearing capacity obtained during the driving of the test pile group is adequate. If doubt exists regarding the ability of the pile to carry the required loading a test may be ordered to determine the pile's performance under a test load.

Subsurface soils are variable within relatively short distances. Peat deposits are quite common in the area and might adversely affect the bearing capacities, requiring additional lengths of pile to reach more competent soils.

Should any questions arise concerning the foundation for this structure, please contact the Orange County Materials Engineer.

Very truly yours,

A. S. KOCH
Road Commissioner
and County Surveyor

BY: _____
W. L. ZAUN
Division Engineer--Operations

WLZ:HJK:bt
cc: B. Muchow
W. Lewis

C05.23

CITY OF HUNTINGTON BEACH

ENGINEERING DEPARTMENT

Huntington Beach, California

November 14, 1967

Orange County Flood Control District
P. O. Box 1078
Santa Ana, California

Attention: Jack Schwartz

Gentlemen:

This office is proceeding with the design of the widening of the Springdale Street Bridge over the East Garden Grove-Wintersberg Channel.

In order to secure more competitive bids, we would like to include an alternate for a 21 inch deep conventionally reinforced deck unit besides the 17 inch prestressed unit. It would function more satisfactorily than the 17 inch unit as it would only have approximately one half the deflection. The asphalt concrete capping quantities are only slightly more and of no significant value. For the 21 inch units, it would consist of 2 inches over the 32 feet of existing deck and 1 inch over the 52 feet of new deck, or an average of 1.38 inches over 84 feet of deck. For the 17 inch units it would consist of 1 inch to 3 inches over the 52 feet of new deck, or 1.24 inches over 84 feet of deck.

Calculations and sketch showing typical section are herein enclosed.

Very truly yours,

James R. Wheeler

James R. Wheeler
Director of Public Works

JRW:DRM:mp

enclos.

RECEIVED
NOV 16 1967
ORANGE COUNTY
FLOOD CONTROL DIST.

ORANGE COUNTY FLOOD CONTROL DISTRICT

INSPECTION ASSIGNMENT

Facility No. C05

TO: O. B. Schooley

Date Assigned June 2, 1967

Maintenance Division

Termination Date None

This is to assign - Permit No. 05767 - Agreement No. _____
for inspection in accordance with the approved plans and specifications herewith.

PERMITTEE City of Huntington Beach

FACILITY AND LOCATION East Garden Grove-Wintersburg Channel at Golden West Street and Warner Avenue.

DESCRIPTION OF PROPOSAL Widening of existing bridges.

REMARKS _____

Upon completion of the permitted work in accordance with the plans, specifications and special provisions, the "AS BUILT" plans and completion report should promptly be returned to the office of the Planning Division.

C. R. Nelson
Planning Division Engineer

COMPLETION REPORT

Contractor _____

Inspector E. J. Hinkson

_____

Surety Not Required

_____ Phone: _____

Bond No. Not Required

Remarks Construction items 30 & 78 to be done by others. Also change noted on sheet 3 of 8.

Liability Ins. Not Required

The permitted work was completed on 1/22/68 in a satisfactory manner and the "AS BUILT" plans submitted herewith for the district's files.

Copies Submitted to:

Const. Div.	☐	Permittee	☐
Design Div.	☐	Planning	☐
Maint. Div.	☐		☐

As Builts updated:

5/1/72 [signature]
DATE SIGNATURE

Signed: E. J. Hinkson
Inspector

O B Schooley
Division Head

F0001-169.1

Structural Design of 4'-0" × 33'-0" Deck Units

Using Conventionally Reinforced Concrete (f'_c = 12000)

JRM 11/13/67

Estimated weight of Deck Units assuming 1½" A.C. Cover

$= \frac{33}{38} \times 28.6 + 18\frac{4(33)}{1000} = 24.7 + 2.4 = \underline{27.1^k}$ (Based on Rockwin chart for 21" deep units)

Max. Mom (effective span = 31')

13.8' 16^k 9^k 11.2 — 31'

$LL+I = 1.30\left[\frac{17.2}{31}(16) + \frac{11.2}{31}(4)\right](3.8)(12) = 2240''\text{-}^k$

$DL = 27.1 \times \frac{31}{8} \times \frac{31}{33} \times 12 = 1180''\text{-}^k$

$\underline{3420''\text{-}^k}$

Max. Shear $\begin{cases} LL+I = 1.30\left[16 + \frac{25}{31}(4) + \frac{9}{31}(16) + \frac{5}{31}(4)\right] = 33.1^k \\ DL = \frac{1}{2}(27.1)\left(\frac{31}{33}\right) = \underline{12.8} \end{cases}$

$\underline{45.9^k}$

Required depth (No compressive steel)

Based on bending $= \sqrt{\frac{6M}{bf_c}} = \sqrt{\frac{6(3420)}{48(1.20)}} = \underline{18.9''}$ controls

Based on shear (No web reinforcement) $= \frac{V}{bjv} = \frac{45.9}{48(7/8)(.060)} = \underline{18.1}$ (without hooks at longitudinal steel)

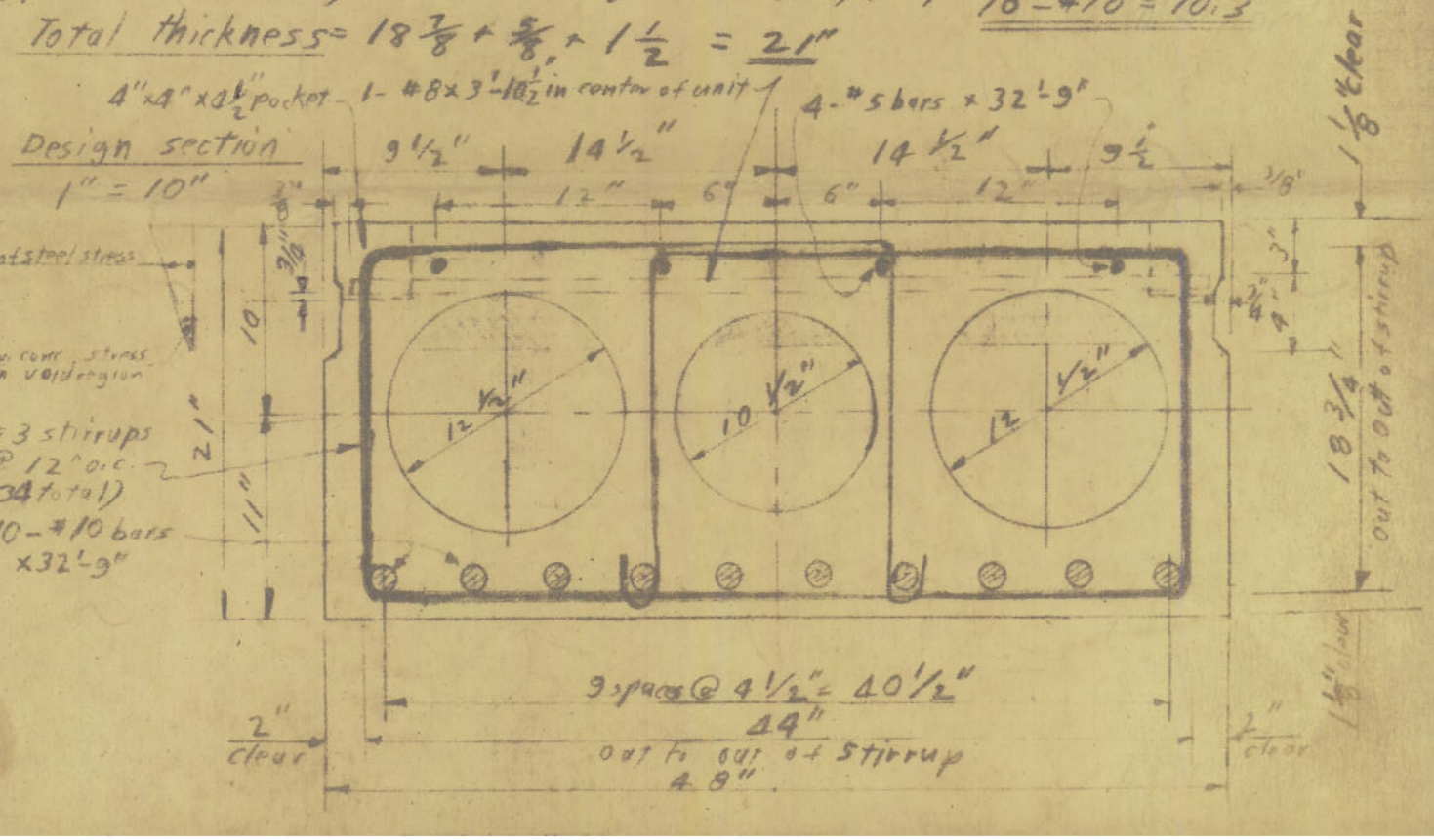
Bond stress $u = \frac{V}{\Sigma o\, jd} = \frac{45,900}{39.4(7/8)(18.9)} = 69.5$ psi $\quad \frac{f_s}{4u} = \frac{20,000}{4(300)} = \underline{16\frac{2}{3}}$ diameters

Required steel Area (No compression steel & solid section)

$A_s = \frac{M}{f_s jd} = \frac{3420}{(20)(7/8)(18.9)} = 10.30''$

$\underline{10 - \#10 = 10.30''}$

Total thickness $= 18\frac{7}{8} + \frac{5}{8}$ " $+ 1\frac{1}{2} = \underline{21''}$



Diagraphagm lengths

Ends (based on developing bond in straight bars)

$= 16\frac{3}{2}(1\frac{4}{9}) + 2.6 =$ **24" minimum**

Center diaphraghm Use **12" minimum**

Top steel Reqd $= \frac{1}{2} \times \frac{4.5}{9.5}$ $\frac{A_c \text{ above } 6.8"}{10} = 0.9\square"$
(to replace voids above)

$4 - \#5 = 1.2\square"$

Area of section

Gross $= 48(21) - 2(3.6) = 1001\square" = 6.95\square'$

Voids $= 2(122.7) + 86.5 = 332\square" = 2.30\square'$

Net Area $= 669\square' = 4.65\square'$

Unit weight

Solid Portion $= 6.95 \times 150 = 1040\#/ft$

Portion with voids $= 4.65 \times 150 = 700\#/ft$

Total weight $= 1040(5) + 700(28) =$ **29,800#**

Dead Load Deflection

(based on $1\frac{1}{2}$" pavement & 31' effective span)

$= \frac{5wl^3}{384EI} = \frac{5(27,100)(372)^3}{384(3,000,000)(33,870)} =$ **0.18"**

No camber Necessary

Shear key shear transfer capability

Per foot $= 60(4)(12) = 2880\#/ft$

Per Unit $= 2880(31) =$ **89,000#** Adequate

Special Units Required

At edge of existing bridge, Lower side key 4"

At outside of new bridge, omit side key

Structural Design of 4'-0" x 33'-0" Deck Units

Using Conventionally Reinforced Concrete ($f'_c = 12{,}000$)

RRM 11/13/67

Estimated weight of Deck Units assuming 1½" Air Cover

$= \frac{33}{38} \times 28.6 + 18\frac{4(33)}{1000} = 24.7 + 2.4 = \underline{27.1^k}$ (Based on Rockwin chart for 21" deep units)

Max. Mom (effective span = 31')

16k, 4k; 13.8', 16', 11.2; 31'

$LL+I = 1.30\left[\frac{17.2}{31}(16) + \frac{11.2}{31}(4)\right](13.8)(12) = 2240^{"-k}$

$DL = 27.1 \times \frac{31}{8} \times \frac{31}{33} \times 12 = 1180^{"-k}$

$3420^{"-k}$

Max Shear $\begin{cases} LL+I = 1.30\left[16 + \frac{25}{31}(4) + \frac{9}{31}(16) + \frac{5}{31}(4)\right] = 33.1^k \\ DL = \frac{1}{2}(27.1)\left(\frac{31}{33}\right) = 12.8 \end{cases}$

45.9^k

Required depth

(No compressive steel)

Based on bending $= \sqrt{\frac{6M}{bf_c}} = \sqrt{\frac{6(3420)}{48(1.20)}} = \underline{18.9"}$ controls

Based on shear (No web reinforcement) $= \frac{V}{bjv} = \frac{45.9}{48(1/8)(.060)} = \underline{18.1}$ (without hooks of longitudinal str.)

Bond stress $u = \frac{V}{\Sigma o j d} = \frac{45{,}900}{39.9(7/8)(18.9)} = 69.5$ psi $\quad \frac{f_s}{4u} = \frac{20{,}000}{4(300)} = \underline{16\frac{2}{3}}$ diameters

Required steel Area

(No compressive steel & solid section)

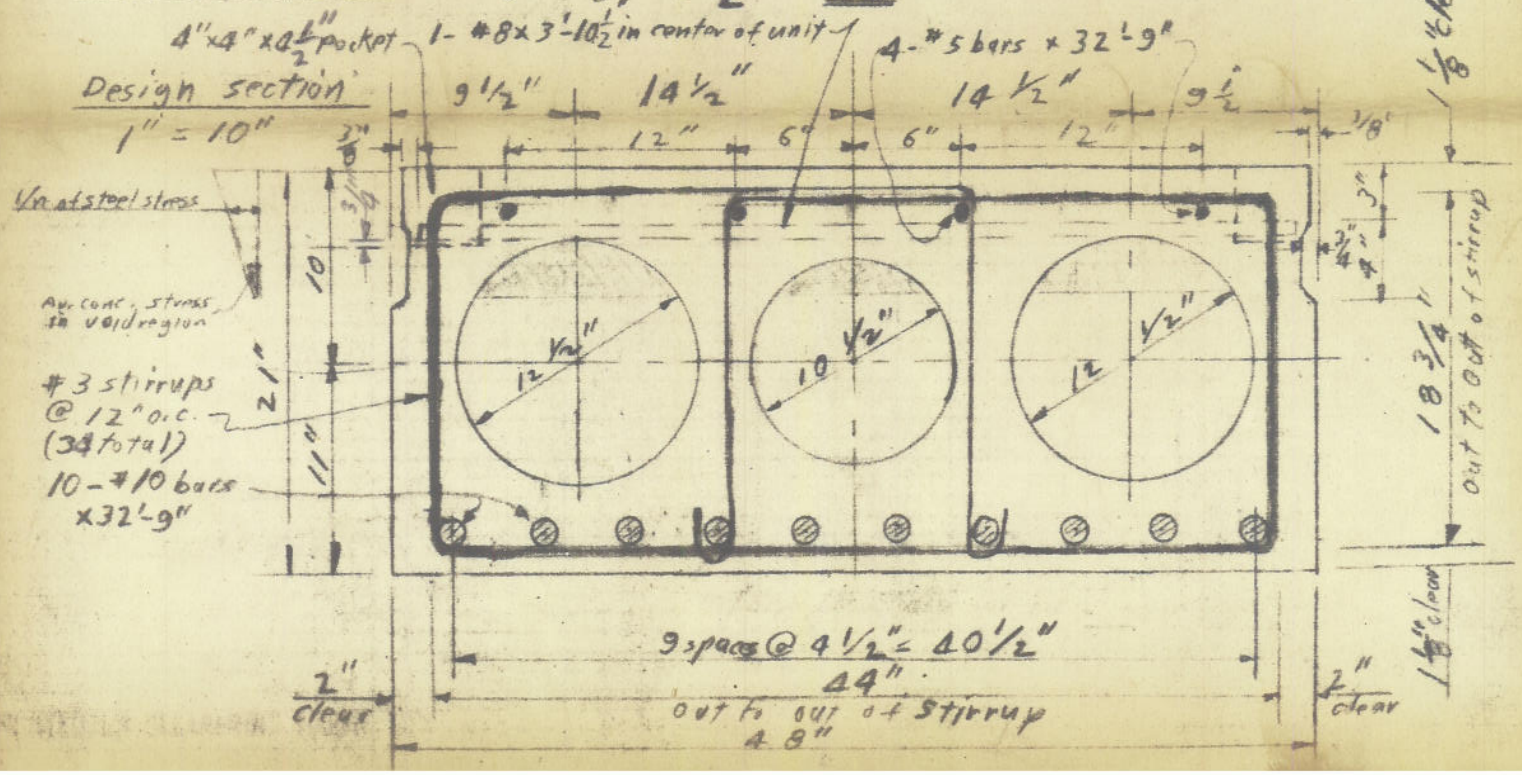
$A_s = \frac{M}{f_s j d} = \frac{3420}{(20)(7/8)(18.9)} = 10.3^{0"}$

$10 - \#10 = 10.3^{0"}$

Total thickness $= 18\frac{7}{8} + \frac{5}{8}" + 1\frac{1}{2} = \underline{21"}$

Design section

1" = 10"



Diagraphagm lengths

Ends (based on developing bond in straight bars)

$= 16\frac{2}{3}(1\frac{1}{4}) + 2.6 =$ **24" minimum**

Center diaphraghm Use **12" minimum**

Top steel Reqd $= \frac{1}{2} \times \frac{6.5}{9.5}$ (To replace voids in kid area) $\frac{A_c \text{ above } 6.8"}{10} = 0.9^{\square"}$

$4 - \#5 = 1.2^{\square"}$

Area of section

Gross $= 48(21) - 2(3.6) = 1001^{\square"} = 6.95^{\square'}$

Voids $= 2(122.7) + 86.5 = 332^{\square"} = 2.30^{\square'}$

Net Area $= 669^{\square"} = 4.65^{\square'}$

Unit weight

Solid Portion $= 6.95 \times 150 = 1040\#/ft$

Portion with voids $= 4.65 \times 150 = 700\#/ft$

Total weight $= 1040(5) + 700(28) =$ **29,800#**

Dead Load Deflection

(based on $1\frac{1}{2}$" pavement & 31' effective span)

$= \frac{5wl^3}{384EI} = \frac{5(27,100)(372)^3}{384(3,000,000)(33,870)} =$ **0.18"**

No camber Necessary

Shear key shear transfer capability

Per foot $= 60(4)(12) = 2880\#/ft$

Per Unit $= 2880(31) =$ **89,000#** Adequate

Special Units Required

At edge of existing bridge, Lower side key 4"

At outside of new bridge, omit side key.

Structural Design of 4'-0" x 33'-0" Deck Units

Using Conventionally Reinforced Concrete ($f'_c = 1200$)

9RM 11/13/67

Estimated weight of Deck units assuming 1½" A.C. Cover

$= \frac{33}{38} \times 28.6 + 18\frac{a(33)}{1000} = 24.7 + 2.4 = \underline{27.1^k}$ (Based on Rockwin chart for 21" deep units)

Max. Mom (effective Span = 31')

13.8' — 16^k — 9^k — 11.2 — 31'

$LL+I = 1.30\left[\frac{17.2}{31}(16) + \frac{11.2}{31}(4)\right](13.8)(12) = 2240''\text{-}k$

$DL = 27.1 \times \frac{31}{8} \times \frac{31}{33} \times 12 = 1180''\text{-}k$

$3420''\text{-}k$

Max. Shear $\begin{cases} LL+I = 1.30\left[16 + \frac{25}{31}(4) + \frac{6}{31}(16) + \frac{5}{31}(4)\right] = 33.1^k \\ DL = \frac{1}{2}(27.1)\left(\frac{31}{33}\right) = 12.8 \end{cases}$

45.9^k

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Bond stress $u = \frac{V}{\Sigma o\, jd} = \frac{45,900}{39.9(7/8)(18.9)} = 69.5\ psi$ $\frac{f_s}{4u} = \frac{20000}{4(300)} = \underline{16\frac{2}{3}\text{ diameters}}$

Required steel Area

(No compressive steel & solid section)

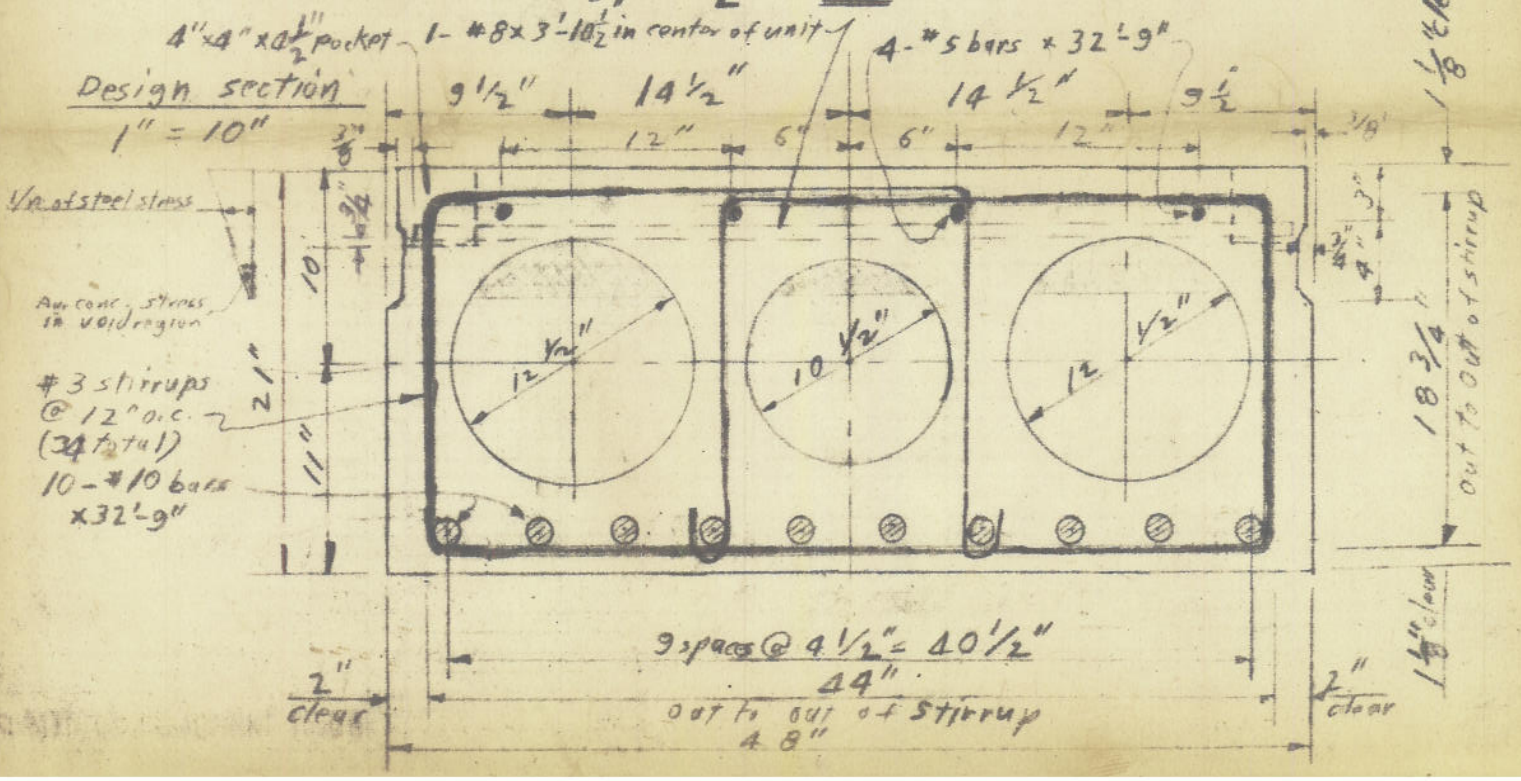
$A_s = \frac{M}{f_s j d} = \frac{3420}{(20)(7/8)(18.9)} = 10.3^{\square"}$

$10 - \#10 = 10.3^{\square"}$

Total thickness $= 18\frac{7}{8} + \frac{5}{8}" + 1\frac{1}{2} = \underline{21"}$

Design section

1" = 10"



DRM 11/13/67

Diagraphagm lengths

Ends (based on developing bond in straight bars)

$= 16\frac{2}{3}(1\frac{1}{4}) + 2.6 =$ **24" minimum**

Center diaphraghm Use **12" minimum**

Top steel Reqd $= \frac{1}{2} \times \frac{6.5}{4.5}$ $\frac{A_c \text{ above } 6.8"}{10} = 0.9^{\square"}$

(To replace voids in "k" area) $53^{\square"}$

4-#5 = 1.2$^{\square"}$

Area of section

Gross $= 48(21) - 2(3.6) = 1001^{\square"} = 6.95^{\square'}$

Voids $= 2(122.7) + 86.5 = 332^{\square"} = 2.30^{\square'}$

Net Area $= 669^{\square'} = 4.65^{\square'}$

Unit weight

Solid Portion $= 6.95 \times 150 = 1040$ #/ft

Portion with voids $= 4.65 \times 150 = 700$ #/ft

Total weight $= 1040(5) + 700(28) =$ **29,800 #**

Dead Load Deflection

(based on $1\frac{1}{2}$" pavement & 31' effective span)

$= \frac{5wl^3}{384EI} = \frac{5(27,100)(372)^3}{384(3,000,000)(33,876)} =$ **0.18"**

No camber Necessary

Shear key shear transfer capability

Per foot $= 60(4)(12) = 2880$ #/ft

Per Unit $= 2880(31) =$ **89,000 #** **Adequate**

Special Units Required

At edge of existing bridge, Lower side key 4"

At outside of new bridge, omit side key.

MINUTES OF THE BOARD OF SUPERVISORS

OF ORANGE COUNTY, CALIFORNIA

June 27, 1967

MC 7-168

IN RE: RIGHT OF WAY CONTRACT SEVENTEENTH STREET BRICKELL

On motion of Supervisor Hirstein, duly seconded and unanimously carried by Board members present, the Chairman Pro Tem and the Clerk are authorized to sign the Right of Way Contract dated June 27, 1967, between the County of Orange and Charles F. Brickell and Gladys E. Brickell providing for the acquisition of right of way for Seventeenth Street, Project No. Z7, Parcel No. 122.

The County Auditor-Controller is instructed to issue his warrant in the amount of $1,203.00 in favor of said grantors or assigns, and additional warrants as required for reconveyance and forwarding fees, not to exceed $15.00 each, in accordance with instructions from the Department of Real Property Services; delivery of said warrants to be delayed pending notice from the Department of Real Property Services that adequate title to the subject property has been obtained.

Said warrants are to be made payable out of Z7, Seventeenth Street, Work Order No. 3690, Account Code 112-3011-360.

IN RE: UTILITIES RELOCATION AGREEMENT EAST GARDEN GROVE-WINTERSBURG CHANNEL CITY OF HUNTINGTON BEACH STANDARD OIL COMPANY

On motion of Supervisor Phillips, duly seconded and unanimously carried by Board members present, the Chairman Pro Tem and the Clerk are authorized to sign the Utilities Relocation Agreement dated June 27, 1967, between the Orange County Flood Control District, the City of Huntington Beach and the Standard Oil Company of California, for cooperation in construction of the East Garden Grove-Wintersburg Channel at Golden West Street.

IN RE: PROPOSED CONVEYANCE OF FOUNTAIN VALLEY CHANNEL CITY OF HUNTINGTON BEACH TO ORANGE COUNTY FLOOD CONTROL DISTRICT

On motion of Supervisor Featherly, duly seconded and unanimously carried by Board members present, the Chief Engineer of the Orange County Flood Control District is authorized to notify the City of Huntington Beach of the District's willingness to take over the Fountain Valley Channel upon formal action of the City Council, as recommended in his letter dated June 27, 1967.

N 5816

UTILITIES RELOCATION AGREEMENT

THIS AGREEMENT, made and entered into this 15th day of May, 1967, by and between THE CITY OF HUNTINGTON BEACH, hereinafter referred to as "CITY", STANDARD OIL COMPANY OF CALIFORNIA, a corporation and ~~STANDARD GASOLINE COMPANY~~, hereinafter collectively referred to as "STANDARD" and ORANGE COUNTY FLOOD CONTROL DISTRICT, hereinafter referred to as "DISTRICT";

R E C I T A L S

A. CITY is preparing plans and specifications, and intends to award a contract for the widening of the Golden West Street bridge crossing the East Garden Grove-Wintersburg Channel of DISTRICT at a location 700'± northerly of Warner Avenue in the City of Huntington Beach.

B. STANDARD owns and maintains three (3) existing pipelines within a 16½' right of way under and by virtue of rights granted by that certain right of way agreement recorded December 6, 1920, in Book 381, Page 81 of Deeds, Records of Orange County, California.

C. CITY recognizes STANDARD's prior rights obtained under said right of way agreement recorded December 6, 1920, in Book 381, Page 81 of Deeds, Records of Orange County, California.

T E R M S

NOW, THEREFORE, in consideration of the mutual benefits to be derived by the parties hereto, it is agreed that:

I. STANDARD will relocate 1-6" and 2-8" oil pipelines from Parcel A indicated on Exhibit A, attached hereto and by reference made a part of this agreement, to Parcel B, as indicated on said Exhibit A, in order to accommodate CITY's proposed bridge widening. CITY will provide 6.5' long pile cap extensions on the easterly side of said bridge to accommodate the relocated pipelines, as indicated on said Exhibit A. STANDARD will remove the portions of the three existing pipelines no longer in use after completion of said relocation.

II. DISTRICT and STANDARD will enter into a Joint Use Agreement in substantially the form of that certain agreement dated September 25, 1962, recorded February 25, 1963, in Book 6443, Page 144, et seq. of Official Records of Orange County, California, that will provide STANDARD

rights in Parcel B of attached Exhibit A equal to the rights STANDARD now holds in Parcel A of said Exhibit A. In exchange for such Joint Use Agreement, STANDARD shall quitclaim all its right, title and interest in and to Parcel A of said Exhibit A to DISTRICT.

III. The estimated cost of work to be done by STANDARD is TWENTY SIX THOUSAND SIX HUNDRED SIXTY-FIVE and NO/100 DOLLARS ($26,665.00).

CITY will reimburse STANDARD for its actual relocation costs within thirty (30) days after receipt of four (4) copies of a properly itemized invoice upon completion of the work and certification by CITY's Resident Engineer that the relocation work is satisfactory. Such costs shall be determined in accordance with STANDARD's regularly established accounting practice and shall include a percentage of the direct costs incurred to cover STANDARD's overhead, supervision and accounting costs.

IV. By reason of the fact that the pipelines are to be relocated by STANDARD's own forces or a contractor under its control, STANDARD hereby releases CITY and DISTRICT from any and all claims for damages to STANDARD's property which may arise directly or indirectly from the relocation of said three pipelines, it being understood, however, that this release does not run to any injury or destruction of STANDARD's property which may result from other construction work carried on in connection with the bridge widening project as a whole.

IN WITNESS WHEREOF, the parties hereto have executed this agreement.

CITY OF HUNTINGTON BEACH

Harold D. Shipley
Mayor

Recommended for Approval

Director of Public Works

APPROVED AS TO FORM

City Attorney

ATTEST:

Paul C. Jones
City Clerk

DATED: JUNE 27, 1967

ORANGE COUNTY FLOOD CONTROL DISTRICT

By
Pro Tem Chairman of its Board of Supervisors

ATTEST:

W. E. ST JOHN , County Clerk and ex-officio Clerk of the Board of Supervisors of Orange County Flood Control District of Orange County, California

By Mabel L Kastens
Deputy

APPROVED AS TO FORM:

Adrian Kenyon,
COUNTY COUNSEL
ORANGE COUNTY, CALIFORNIA

By James S Yeager

~~STANDARD GASOLINE COMPANY~~

~~Its Attorney in Fact~~

STANDARD OIL COMPANY OF CALIFORNIA

By R B Shulte
Manager, Real Estate and Right of Way, Land Department, Standard Oil Company of California, Western Operations, Inc., a division of said Company

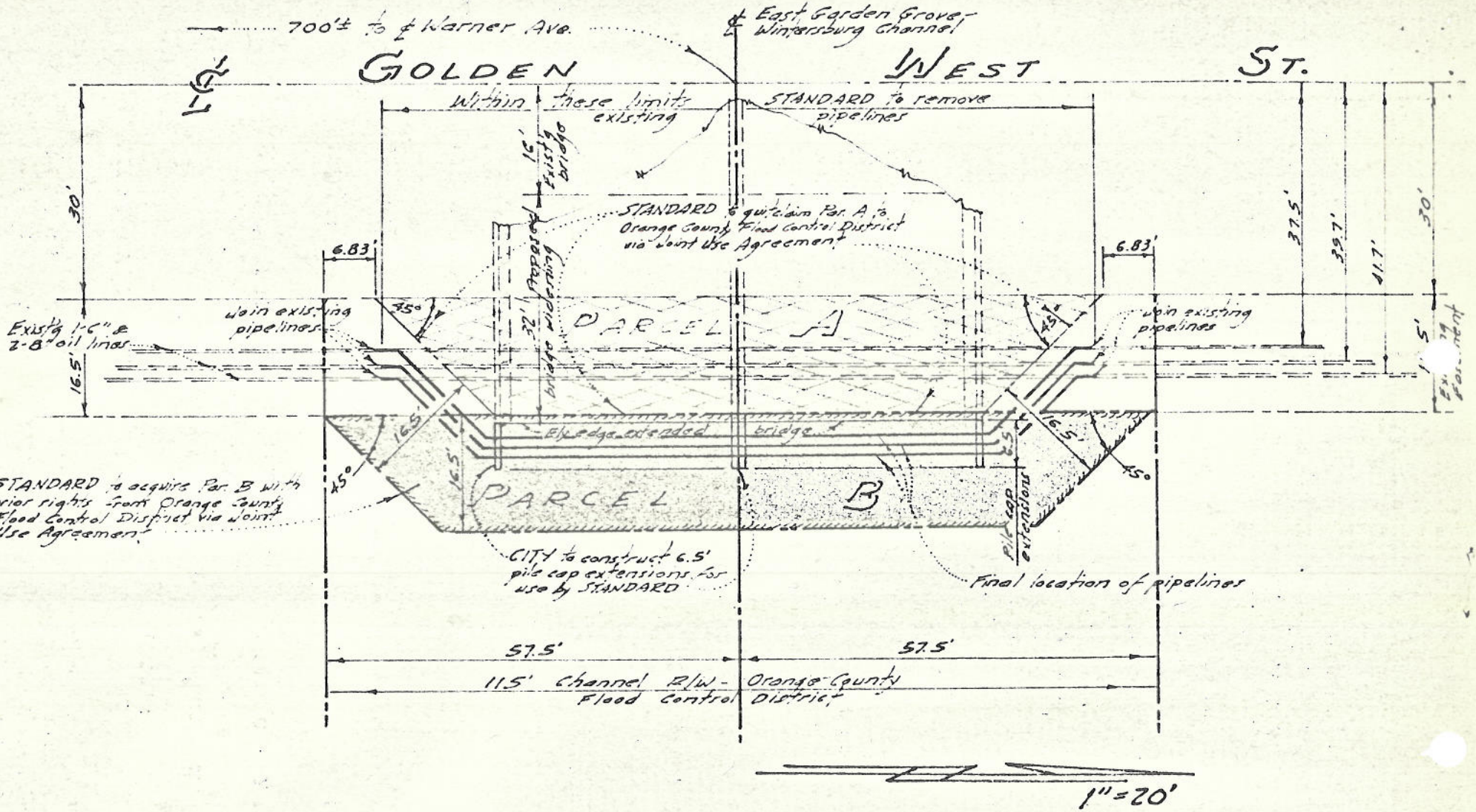


EXHIBIT A for

Utilities Relocation Agreement

by and between

CITY OF HUNTINGTON BEACH

and

STANDARD OIL COMPANY OF CALIFORNIA - STANDARD GASOLINE COMPANY

April 1967

C05.72

Southern California Edison Company

SCE

Huntington Beach, California
June 12, 1967

Orange County Flood Control District
13872 E. Garden Grove Blvd.
Orange, California

Attention: Mr. A. L. Walters

Gentlemen:

The City of Huntington Beach is about to start work on the Goldenwest and Warner Avenue bridge widening projects.

As our proposed 12 KV lines will be crossing over the bridge area at these two location, it is our understanding that no permit will be required. I have enclosed a sketch showing methods of crossing for your inspectors' use.

If anything other than our sketches is required, will you please contact me at 538 Main Street in Huntington Beach or call 547-7581.

Very truly yours,

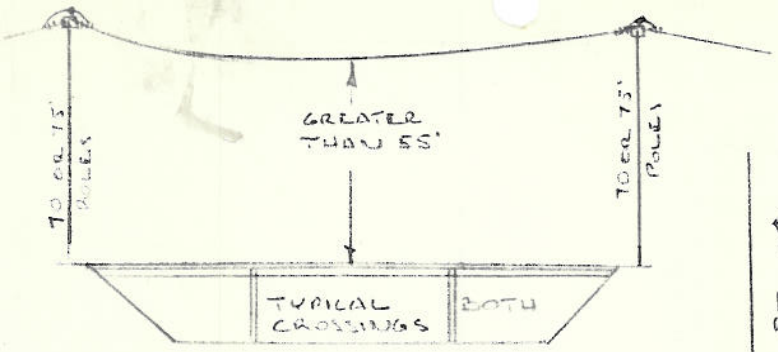
Ralph C. Kiser, District Manager

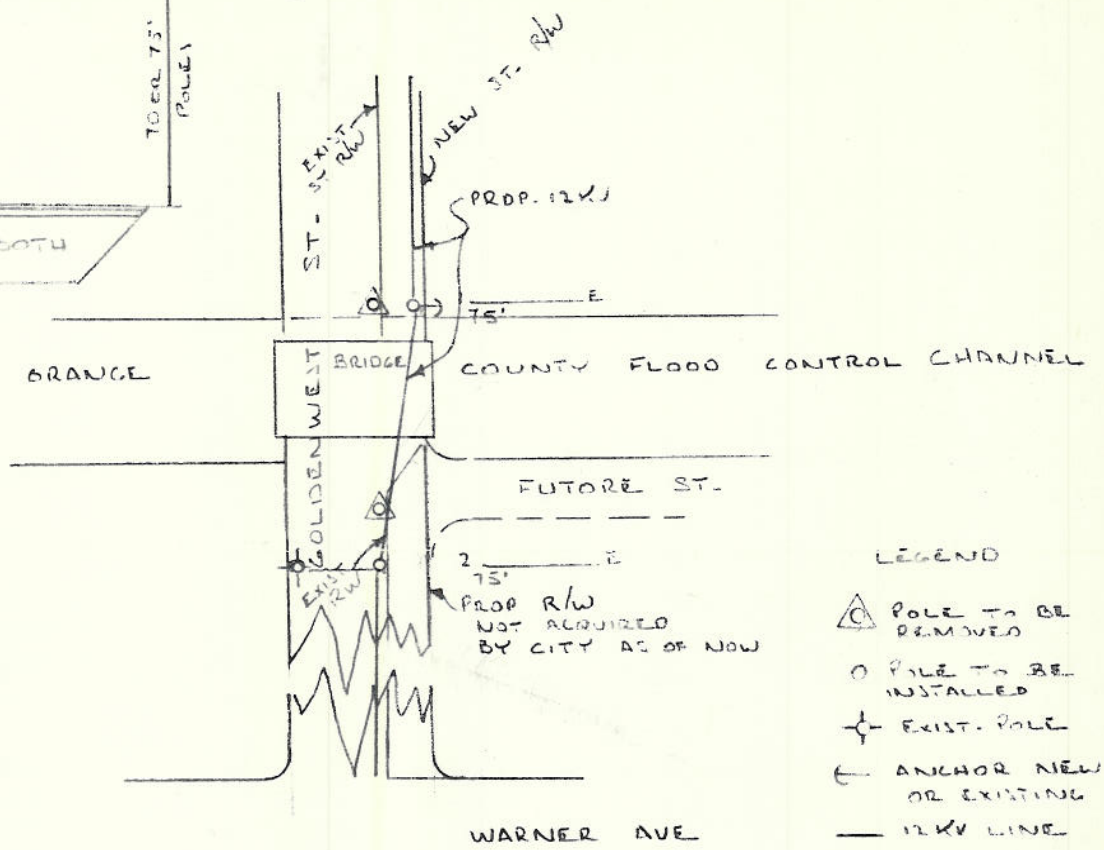
L. J. Hargreaves

L. J. Hargreaves
Customer Service Planner

LJH:jh
Enclosures

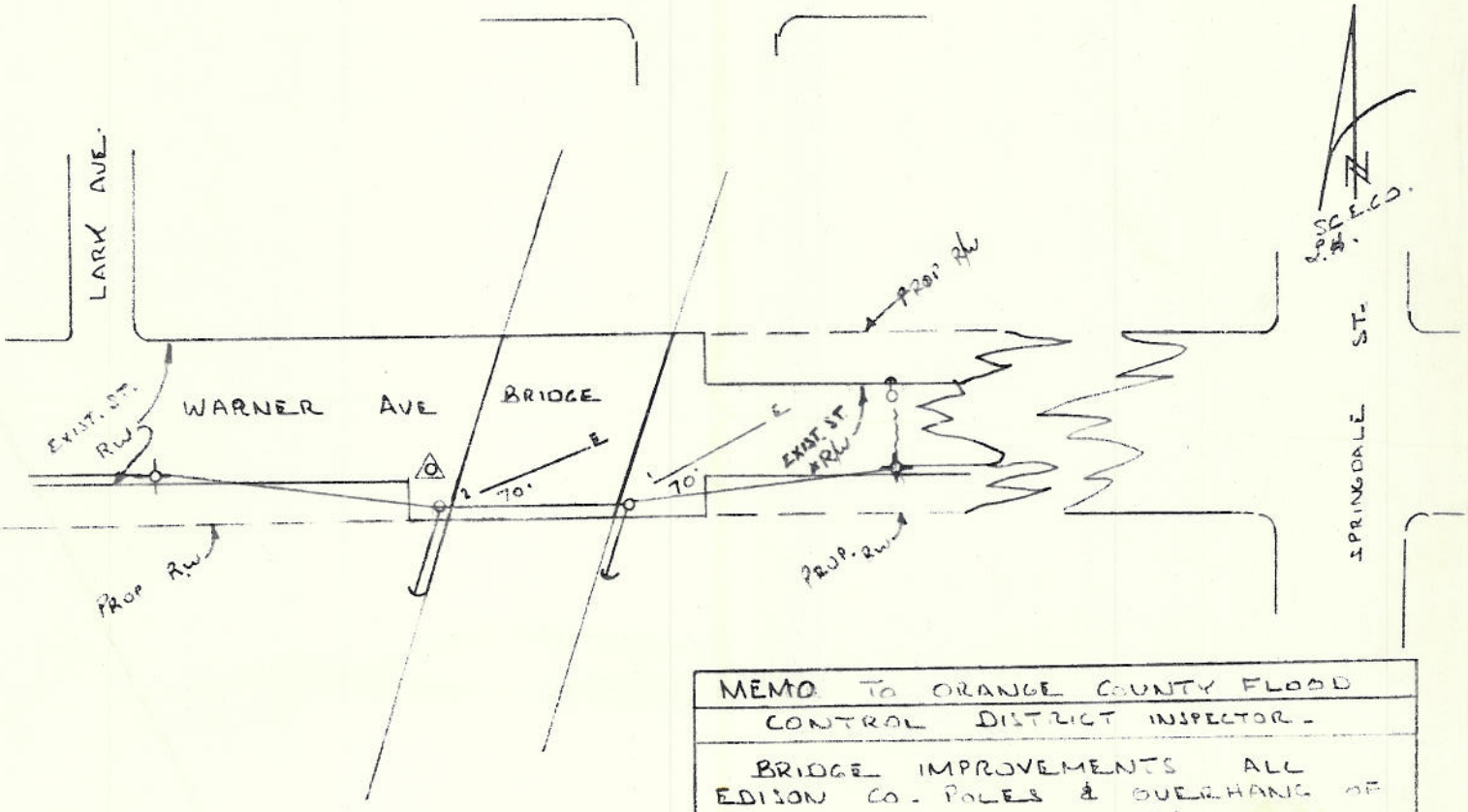
OK
RB





LEGEND

- POLE TO BE REMOVED
- POLE TO BE INSTALLED
- EXIST. POLE
- ANCHOR NEW OR EXISTING
- 12KV LINE



MEMO TO ORANGE COUNTY FLOOD CONTROL DISTRICT INSPECTOR -
BRIDGE IMPROVEMENTS ALL EDISON CO. POLES & OVERHANG OF WIRES OVER STREET R/W
ALL HEIGHT REQUIREMENTS FOR ORANGE COUNTY FLOOD CONTROL DISTRICT CROSSINGS WILL BE MAINTAINED.

ORANGE COUNTY FLOOD CONTROL DISTRICT
MEMORANDUM

Date: September 28, 1967

To: O. B. Schooley — Maintenance Superintendent

From: R. D. Burk — Orange County Flood Control District

Subject: Widening of Goldenwest St. & Warner Ave. over CO5 Ch. - Permit #05767

Attached are revised plans for above work. Please use in lieu of existing sheets for "As Builts".

Plans approved
W.R. Jenson

RDB/dmt

Signed R D B

C05·23

CITY OF HUNTINGTON BEACH

ENGINEERING DEPARTMENT
Huntington Beach, California

July 19, 1967

Orange County Flood Control District
P. O. Box 1078
Santa Ana, California

Subject: Bridge Widenings on Goldenwest Street & Warner Avenue over the East Garden Grove Wintersburg Channel.

Gentlemen:

Enclosed are two copies each of sheets 1 and 4 of the subject project, the originals of which have been revised in pencil and copies given to the contractor. The purpose of the revisions are to allow the piles to clear pipelines, both underground and also those supported alongside the existing bridges. It is to be noted that for the Golden West Bridge, the pipes described in notes (5) and (9) were only slightly off the locations given by their owners whereas, the Gulf Oil line, note (34) is in excess of two feet off the location given. As the pipelines for the Warner Avenue bridge have not been located in the field, it is anticipated that there could be further relocations.

It is also to be noted, by studying the structural calculations, that the pile cap is designed with sufficient strength to accomodate the relocations, and that as long as any two adjacent pile spacings do not deviate too far from the average spacing for the bent, excessive loadings of an individual pile will not occur.

Very truly yours,

James R. Wheeler
Director of Public Works

by H. E. Hartge
H. E. Hartge
Deputy Director of Public Works

JRW:HEH:DRM:mp

enclos.

RECEIVED
JUL 24 1967
ORANGE COUNTY
FLOOD CONTROL DIST.

A33.13
Flood

Nelson

MINUTES OF THE BOARD OF SUPERVISORS
OF ORANGE COUNTY, CALIFORNIA

May 31, 1967

M67-133

IN RE: PERMIT EAST GARDEN GROVE-WINTERSBURG CHANNEL CITY OF HUNTINGTON BEACH

On motion of Supervisor Phillips, duly seconded and unanimously carried, the Chairman and the Clerk are authorized to sign Permit No. 05767, dated May 31, 1967, authorizing the City of Huntington Beach to widen the existing Warner Avenue and Golden West Street bridges over the Orange County Flood Control District's East Garden Grove-Wintersburg Channel.

IN RE: PERMIT WESTMINSTER CHANNEL AND EAST GARDEN GROVE-WINTERSBURG CHANNEL CITY OF WESTMINSTER

On motion of Supervisor Featherly, duly seconded and unanimously carried, the Chairman and the Clerk are authorized to sign Permit No. 14966, dated May 31, 1967, authorizing the City of Westminster to construct reinforced concrete box culverts and street crossing of the Orange County Flood Control District's Westminster Channel and East Garden Grove-Wintersburg Channel.

IN RE: PERMIT ANAHEIM-BARBER CITY CHANNEL CITY OF GARDEN GROVE

On motion of Supervisor Phillips, duly seconded and unanimously carried, the Chairman and the Clerk are authorized to sign Permit No. 16666, dated May 31, 1967, authorizing the City of Garden Grove to construct an extension to the Gilbert Street culvert and appurtenant street improvements within the Orange County Flood Control District's right of way for the Anaheim-Barber City Channel.

IN RE: AUTHORIZE NEGOTIATION OF AGREEMENT FOR JAMBOREE ROAD BRIDGE CONSTRUCTION SAN DIEGO CREEK CHANNEL CITY OF NEWPORT BEACH

On motion of Supervisor Allen, duly seconded and unanimously carried, the Chief Engineer, Orange County Flood Control District, is authorized to negotiate an agreement with the City of Newport Beach for cooperation in construction of Jamboree Road bridge, San Diego Creek Channel, as set forth in his letter, dated May 31, 1967.

C05.72

CITY OF HUNTINGTON BEACH

ENGINEERING DEPARTMENT
Huntington Beach, California

January 24, 1967

Orange County Flood Control District
P. O. Box 1078
Santa Ana, California

Attention: Mr. H. G. Osborne,
Chief Engineer

Subject: Golden West Street
and Bridge Widening

Gentlemen:

In order to expedite the design of the Golden West bridge widening over the East Garden Grove-Wintersberg channel, we are hereby enclosing two prints of our preliminary layout.

Please review this drawing and return one copy with your suggestions and comments at your earliest convenience.

Very truly yours,

James R. Wheeler
Director of Public Works

JRW:DRM:mp

enclos. (2)

RECEIVED
JAN 25 1967
ORANGE COUNTY
FLOOD CONTROL DIST.

PROPOSAL TO THE CITY OF HUNTINGTON BEACH

FOR THE CONSTRUCTION OF THE BRIDGE WIDENINGS ON WARNER AVENUE AND ON GOLDEN WEST STREET WHERE SAID STREETS CROSS THE EAST GARDEN GROVE-WINTERSBURG CHANNEL, ALL IN THE CITY OF HUNTINGTON BEACH, CALIFORNIA

To the Honorable Mayor and City Council,
City of Huntington Beach, California:

In compliance with the annexed notice inviting sealed proposals, I hereby propose and agree to enter into a contract to perform the work herein described and to furnish the materials therefore according to the plans, specifications and special provisions for the said work and to the satisfaction of and under the supervision of the Director of Public Works of said City of Huntington Beach.

The undersigned has not accepted any bid from any subcontractor or materialman through any bid depository, the by-laws, rules or regulations of which prohibit or prevent the contractor from considering any bid from any subcontractor or materialman, which is not processed through said bid depository, or which prevent any subcontractor or materialman from bidding to any contractor who does not use the facilities of or accept bids from or through such bid depository.

For the furnishing of all labor, materials and equipment, and do all incidental work necessary to deliver all the improvements complete in place in strict conformity with the plans, specifications and special provisions, on file in the office of the Director of Public Works, City of Huntington Beach, California, I propose and agree to take full payment therefor at the following unit prices, to wit:

Item	Approximate Quantity	Items with Unit Price Written in Words	Unit Price	Total
1.	Lump Sum	Construction & Removal of Oil Line support structures at _____ per lump sum		
2.	Lump Sum	12" Waterline to be relocated at _____ per lump sum		
3.	Lump Sum	5' Chain Link Fence to be relocated at _____ per lump sum		

Item	Approximate Quantity	Items with Unit Price Written in Words	Unit Price	Total
4.	Lump Sum	Guard Rail Removal at_____ per lump sum		
5.	2 each	Existing pile cap projections to be removed at_____ per each		
6.	4 each	Existing Wingwalls to be removed at_____ per each		
7.	1,504 lin. ft.	Reinforced Concrete Piling Furnished at_____ per l.f.		
8.	34 each	Driving of Reinforced Concrete Piles at_____ per each		
9.	4 each	Abutment Pile Caps Constructed at_____ per each		
10.	4 each	Wingwalls Constructed at_____ per each		
11.	2 each	Center Pile Caps Constructed at_____ per each		
12.	32 each	Prestressed Concrete Deck Units in place (4' x 33') at_____ per each		
13.	132 lin. ft.	Integral curb, sidewalk and parapet wall constructed at_____ per l.f.		
14.	260 lin. ft.	3"x12" Creosoted Timber Planks in place at_____ per l.f.		

(Item Nos. 15 through 19, not used)

Item	Approximate Quantity	Items with Unit Price Written in Words	Unit Price	Total
20.	Lump Sum	18" Waterline to be relocated at_____ per lump sum		
21.	Lump Sum	5' Chain Link fence to be relocated at_____ per lump sum		
22.	Lump Sum	Grard rail to be removed at_____ per lump sum		
23.	4 each	Existing Walls to be removed at_____ per each		
24.	4,600 lin. ft.	Furnishing of reinforced Concrete Piling at _____ per l.f.		
25.	82 each	Driving of reinforced concrete piling at___ _____ per each		
26.	4 each	Construction of Abutment Pile Caps at_____ per each		
27.	4 each	Construction of Wingwalls at_____ per each		
28.	6 each	Construction of interior pile caps at_____ per each		
29.	72 each	Prestressed concrete deck units in place (4'-0" x 35'0") at_____ per each		
30.	16 each	Prestressed concrete deck units in place (3'-0" x 35'-0") at_____ per each		

Item	Approximate Quantity	Items with Unit Prices Written in Words	Unit Price	Total
31.	280 Lin. ft.	Construction of Integral curb, sidewalk and Parapet Wall_____ per 1.f.		

Bid for Golden West Street Bridge
(Items 1 through 14) $_____

Bid for Warner Avenue Bridge
(Items 20 through 31) _____

TOTAL BID
(Items 1 through 14 and 20 through 31)

$_____

The undersigned understands the contract time limit alloted for the contract is 120 calander days as specified in Section VII of the Special Provisions.

If awarded the contract, the undersigned hereby agrees to sign said contract, and furnish the necessary bonds within ten (10) days of the award of said contract, and to begin work within ten (10) days from the date of approval of the contract by the City of Huntington Beach, California.

The undersigned has examined the location of the proposed work and is familiar with the plans, specfications and special provisions and the local conditions at the place where the work is to be done.

Accompanying this proposal is_____
(NOTICE: Insert the words CASH, CASHIER'S CHECK, CERTIFIED CHECK, or BIDDER'S BOND, as the case may be).

Licensed in accordance with an act providing for the registration of contrqcts.

LicenseNo._____

_____

_____

_____
Signature of Bidder

Business Address_____

Place of Residence_____

Dated this_____day of _____1967.

PROPOSAL

INFORMATION REQUIRED OF BIDDERS

The bidder is required to supply the following information. Additional sheets may be attached if necessary.

(1) Address: _____ (2) Telephone: _____

(3) Type of firm - Individual, Partnership, or Corporation: _____

(4) Corporation organized under the laws of the State of: _____

(5) Contractor's License No: _____

(6) List the names and addresses of all members of the firm or names and titles of all officers of the corporation:

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

(7) Number of years experience as a contractor in construction work: ____

(8) List at least six projects completed as of recent date:

Contract amount - Class of Work - Date Completed - Name and Address of Owner

_____

_____

_____

_____

_____

_____

(9) List the name of the person who inspected the site of the proposed work for your firm: _____ Date of inspection: ____

(10) If requested by the District, the bidder shall furnish a notarized financial statement, financial data, or other information and references sufficiently comprehensive to permit an appraisal of his current financial condition.

PROPOSAL

SUB-CONTRACTOR - LISTING

Pursuant to the Government Code 4100, the prime contractor, in order for this proposal to be acceptable for consideration shall furnish the name and location of the place of business of each sub-contractor who will perform work or render service on this project in an amount exceeding one half of one per cent of the total bid.

Work to be Performed	Sub-Contractor	Sub-Contractors address

By submission of this proposal, the contractor certifies:

1. That he is able to and will perform the balance of all work which is not covered in the above sub-contractor listing.

2. That the City will be furnished copies of all sub-contracts entered into and bonds furnished by sub-contractor for this project.

S P E C I F I C A T I O N S

AND

S P E C I A L P R O V I S I O N S

FOR

THE CONSTRUCTION OF THE BRIDGE WIDENINGS ON WARNER AVENUE AND ON GOLDENWEST STREET WHERE SAID STREETS CROSS THE EAST GARDEN GROVE-WINTERSBURG CHANNEL, ALL IN THE CITY OF HUNTINGTON BEACH, CALIFORNIA

Prepared by

THE CITY OF HUNTINGTON BEACH

DIRECTOR OF PUBLIC WORKS

May, 1967

APPROVED _____
Director of Public Works, City of Huntington Beach

$5.00 Charge,
Not Refundable

SPECIAL PROVISIONS

SECTION I DESCRIPTION OF WORK

The work to be done consists, in general, of adding 32'-4" in width by 67'-7" in length to each side of the existing bridge at Golden West Street and 42'-6" in width by 141'-9" in length to each side of the existing bridge at Warner Avenue, each bridge crossing the East Garden Grove-Wintersburg Channel. The construction consists of precast, prestressed concrete deck units over reinforced concrete pile caps and piles.

SECTION II SPECIFICATIONS

The work to be done under this contract shall comply with the foregoing specifications and with the Standard Specifications of the State of California, Department of Public Works, Division of Highways, Dated July 1964, insofar as the same may apply, and shall also comply with the following Special Provisions.

The term "State Standard Specifications," when herein after used, shall be interpreted as meaning, and being synonymous with the Standard Specifications of the State of California, Department of Public Works, Division of Highways, Dated July, 1964.

In case of conflict between the Specifications, or the State Standard Specifications, and these Special Provisions, the Special Provisions shall take precedence over and be used in lieu of such conflicting portions.

SECTION III PLANS

The work to be done under this contract shall comply with the Improvement Plans, and said plans form a part of the contract documents and are on file in the office of the Director of Public Works, The contract documents shall consist of the following listed items:

1. Improvement Plans
2. Applicable sheets of the City of Huntington Beach Standards
3. Specifications and Special Provisions
4. Proposal
5. The Contract and/or agreement
6. The Contractor's bonds.

SECTION IV TESTING

The testing of any materials or of any portion of the job under construction shall be at the option of the Director of Public Works or his authorized agents. The contractor shall furnish, without charge, any materials requested for testing in accordance with Section 6 of the State Standard Specifications. The Contractor shall also, provide access to any area of the job for testing purposes and shall furnish, without cost, any assistance necessary to perform the testing. The charges for the testing will be paid by the City of Huntington Beach. The Contractor shall notify the Director of Public Works of the readiness of any phase of construction to be tested and shall not proceed with any subsequent phase of work until the results of the tests are known and approved. Testing shall be performed by the County of Orange, Materials Testing Laboratory.

SECTION V INSPECTION

The work to be done under this contract is under the Arterial Highway Financing Program in cooperation with the County of Orange and also under the State of California allocation of gas tax funds. However, the Contractor shall recognize the Director of Public Works of the City of Huntington Beach as the project Engineer, who shall be in charge of and authorize the inspection of the project. The Contractor shall provide access at all times to any area of the project for inspection purposes and shall furnish, without cost, any assistance necessary to complete required inspections. A twenty-four (24) hour notice shall be given prior to commencing the project, and during construction the Contractor shall give due notice, satisfactory to the inspector, of the readiness of any phase of construction to be inspected and shall not proceed without approval.

SECTION VI CONSTRUCTION DETAILS

(a) Existing Highway Facilities - This work shall consist of removing existing highway facilities which interfere with construction, and protecting and/or relocating existing highway facilities which are to remain. All work to be done under this section shall be done in accordance with these Special Provisions and in accordance with Section 15 of the State Standard Specifications. Unless otherwise herein specified, pipe line and utility relocations are to be done by their owners, and it shall be the Contractor's responsibility to communicate with said owners to establish schedules for removal, relocation, etc. In addition to the miscellaneous items described in Section 15 and shown on the plan, the following specific pay items shall be considered in the prosecution of this contract.

1. Construction and Removal of Oil Line Support Structures

This work consists of the complete removal of the reinforced concrete pile cap and two piles supporting the three Standard Oil Company pipe lines on the east side of the Golden West Street Bridge; the construction of a temporary timber support structure capable of fully preventing harmful deflections of the pipe lines, the removal of said timber support structure after pipe lines have been relocated by Standard Oil Company to their ultimate location, the removal of the interfering portions of the two steel pipe support structures in the channel banks, and also any interfering remainder of any portion of said pipe lines abandoned by Standard Oil Company. Due to prior rights, and in accordance with the terms of an agreement between Standard Oil Company and the City; the above mentioned pipelines are to remain in continuous service except for a short time during the relocation by Standard Oil Company to the new pile cap projection. Therefore the Contractor shall schedule his work accordingly, which means that the east center bent must be constructed while the pipe lines remain in their existing position.

Payment for this item shall be on a lump sum basis and is identified as item 1 in the proposal and construction notes (1) and (6) on the plans.

2. Twelve Inch Water Line to be Relocated

This work consists of relocating the existing 12 inch water line on the existing pile cap projection on the west side of the Golden West Street Bridge. The maximum time that this line shall be per-

mitted to be out of service is sixty (60) working days. All opening and closing of valves shall be done by the City Water Department personnel only, upon 24 hours advance notice. To take this line out of service, Water Department personnel will close valves on Golden West Street at Warner Avenue, Marilyn Drive, Murdy Park, and Lydia Drive. Within six hours after closure the section to remain south of the bridge shall be plugged or capped, and the valve at Warner partially reopened by Water Department personnel to restore service to the service station at the northwest corner of Golden West Street and Warner Avenue. Within twenty four hours after the above mentioned closure, the section to remain north of the bridge shall be plugged or capped, and the valves at Lydia Drive and Murdy Park fully reopened by Water Department personnel to restore service to Murdy Park. However, prior to placing the line in service, those portions between the closed valves shall be pressure tested and chlorinated by the Contractor in accordance with the applicable sections of the Standard Water Specifications of the City of Huntington Beach. The Contractor shall be held responsible for any damage caused by the plugs or caps working loose under pressure. All pipe between the two specified thrust blocks shall be 11.938 inch I.D., 12-3/4" O.D. steel cylinder coated inside with 1/2" cement mortar lining and bituminous wrapped on the outside as now existing. All joints shall be either welding flanges or bolted flanges as now existing. All damaged lining, whether existing, or caused in the relocation, shall be repaired to the satisfaction of the Engineer. Thrust blocks shall be of Class A concrete per Section 90 of the State Standard Specifications. All ends of existing pipe that is abandoned in place shall be plugged with not less than 8 inches of Class B Concrete. Payment for this item shall be on a lump sum basis and is identified as Item 2 in the Proposal and Construction Note (2) on the plans.

3. Eighteen Inch Water Line to be Relocated.

This work consists of relocating the existing 18 inch waterline now supported on brackets on the north side of the Warner Avenue Bridge. The maximum time that this line shall be permitted to be out of service is five (5) consecutive working days beginning at 8:00 a.m. Monday morning and ending at 5:00 p.m. on Friday, at which time service must be restored. The general requirements for doing this work shall be as specified in Sub-section VI (a)-2 above. To take this line out of service, Water Department personnel will close valves on Warner Avenue at Graham Street, Lark Circle, and Springdale Streets. Said valves shall remain closed during the entire five day maximum period of relocation. Temporary plugs shall be installed sufficient to prevent soil and other foreign matter from entering the severed pipe. Permanent plugs shall be installed and the line chlorinated as specified in Subsection VI (a)-2 above.

The order of construction will be to construct the interior pile bents with the existing pipeline in place; then relocate the pipeline after the pile caps have sufficiently cured. As it will be necessary to remove those supporting brackets which are attached to the existing pile caps, the Contractor shall provide sufficient other support as needed.

All pipe between the two specified thrust blocks shall be 17.376 I.D., 18" O.D. steel cylinder coated inside with 1/2" cement mortar lining and bituminous wrapped on the outside as now existing. All new joints shall be beveled and slot welded as is now existing to provide full strength. Payment for this item shall be on a lump sum

sum basis and is identified as Item 20 in the proposal and Construction note (54) on the plans.

4. Five foot Chain Link Fence to be Relocated

This item consists of removing the existing fence and gates between the Flood Control Districts' right-of-way lines and reinstalling the fence and gates to the new location as shown on the plans. All materials to be reused must be in as good a condition as the average condition of the entire right-of-way fence in the vicinity of the work or they will be rejected. The Contractor should include in his bid an allowance for any new materials that may be required. Payment for these items shall be on a lump sum basis which are identified as Items 3 and 21 in the Proposal and Construction notes (11) and (57) respectively on the Plans.

5. Removal of Existing Pile Cap Projections

The existing pile cap projections shall be broken up, removed, and disposed of as specified in Section 7-1.13 of the State Standard Specifications. The projecting steel shall be preserved for a minimum length of 24 inches to lap with the steel in the new pile caps. Care shall be exercised to provide a neat breakline at the surface. Payment for this item shall be on a unit price basis per pile cap projection removed and is identified as Item 5 in the Proposal and Construction note (20) on the Plans.

6. Removal of Existing Wing Walls

The existing wing walls shall be broken up, removed, disposed of, and projecting steel preserved as specified in Subsection VI (a)-5 above. Payment for these items is on a unit price basis per wing wall removed and is identified as Items 6 and 23 in the proposal and construction notes 22 and 77 respectively on the plans.

7. Guard Rail Removal

The guard rails shall remain in place until such time as the deck units are ready to be placed on the new pile caps. It is the intent to have the edges of the existing bridge unprotected for the minimum practical time and the contractor shall schedule this work accordingly. The Contractor shall deliver the materials removed to the Orange County Flood Control District Maintenance Yard at 800 East Walnut Street, Fullerton, California, or elsewhere within the same distance if directed by the Engineer. Payment for these items shall be on a lump sum basis per bridge cleared of guard rails and is identified as items 4 and 22 in the proposal and construction notes (12) and (58) respectively on the plans.

(b) Clearing and Grubbing - Clearing and grubbing shall be in accordance with Section 16 of the State Standard Specifications. Payment shall be considered to be included in those items for which it is associated.

(c) Watering - This work shall consist of applying any water used in the project for either construction purposes or dust control as specified in Sections 10, 17, or elsewhere in the State Standard Specifications.

The Contractor shall use water as needed or directed by the Engineer. The Contractor shall make arrangements with the Huntington Beach Water Department for locations to obtain water which shall be furnished as needed without charge to the Contractor. Payment for applying water shall be considered as included in those bid items for which it is associated, including dust control. Any hydrant used for service must be supplied with an approved eddy valve by the Contractor and inspected by the Water Department before actual use.

(d) Earthwork - This work shall consist of excavation for the abutment pile caps and adjacent shelves to the lines and grades shown on the plans and using the material removed to extend the channel roadway fills as shown on the plans or directed by the Engineer. It should be anticipated that material removed from the Golden West Street Bridge may have to be delivered to the Warner Avenue Bridge. It is the intent to reshape the channel roadways at the Warner Avenue Bridge to provide access for maintenance vehicles to Warner Avenue at all four roadways using material removed from excavations only. All work shall be done in accordance with the applicable portions of Section 19 of the State Standard Specifications. Payment for all earthwork as herein specified or indicated on the plans shall be considered as being included in these items for which it is associated, including, but not limited to levee or channel roadway construction, stockpiling, structural excavation, structural backfill, pipe trenching, bedding and backfill, and pavement patching with the materials equivalent to those existing in place.

(e) Piling - This work shall consist of driving pilings at the locations, to the tip elevations, and to the minimum specified bearing values as specified in the plans in accordance with the applicable provisions of Section 49 of the State Standard Specifications. To comply with said Section 49 for the maximum specified bearing value of 62 tons for the outside piles of the interior bents, a pile driver with a minimum energy rating of at least 14,000 foot-pounds is required. The tip elevations specified in the plans are minimum. No tip elevation above the specified value shall be permitted except with the written permission of the Engineer. For the convenience of the Contractor, boring logues of the original (1959) bridge project are included in the plans for the proposal, however, it shall be understood that the city does not guarantee their accuracy or reliability. Due to the uncertainty of the precise locations of buried pipe lines, the Contractor shall prove that the specified locations for an entire bent will clear pipe lines before driving any piles in that bent. For the Golden West Street Bridge this must be done either by probing or open cut trenching to expose the existing pipe line. The type of piling used may be any of the applicable alternates shown on sheet 6 of the plans structurally capable of sustaining the design loads within the usual safety factors. For the abutment piles, the ground level shown on the plan shall be construed to mean the elevation of the flow line of the channel and not the ground level at the pile cap, and the reinforcing steel shall extend a minimum of five (5) feet below said channel flow line. The driving methods, materials, and construction shall be as specified in Section 49 and elsewhere in the State Standard Specifications. The type of piling now in place is believed to be alternate "U" type II asshown on said sheet 6 of the plans.

Payment for piling work is divided into two categories, furnishing and driving. Payment for furnishing piling shall be on a unit price basis per foot of piling successfully in place measured from the tip (excluding the driving point) to the cut-off plane. No allowance shall be made for piling damaged, removed, or cut off to either expose reinforcing steel, or extra cutoff lengths due to obstructions such as pipelines or existing structure. The pay items for furnishing reinforced concrete piling are identified as items 7 and 24 in the proposal and construction notes 14 and 65 respectively in the plans. Payment for driving piles shall be on a unit price basis per pile successfully driven and no adjustment shall be made for piles redriven or driven deeper than anticipated to reach specified bearings, except as specified above. The pay items for driving reinforced concrete piling are identified as items 8 and 25 in the proposal and construction notes 14 and 65 respectively in the plans.

(f) Reinforced Concrete Structures - This work shall consist of constructing the reinforced concrete structures in accordance with Sections 51, 52 and 90 of the State Standard Specifications. Concrete shall be Class A, all exposed concrete shall have Class 1 surface finish, and reinforcement shall be as specified therein. The following specific items shall be considered in the prosecution of this contract:

1. Construction of Interior Pile Caps

As shown on the plans and specified above, the interior pile caps, including projections, shall be constructed in a single pour to the lines and grades specified therein. The inside ends for the Golden West Bridge shall be joined to the existing pile caps by the existing steel in the removed pile cap projections extending 24 inches minimum into the new pile caps.

For the Warner Avenue Bridge the inside ends shall be joined by chipping away the existing concrete to expose and uncoil the hooks of the existing steel which shall be full strength welded to the required bars in the new pile caps. Care shall be taken to prevent spalling of the sides or bottom of the existing pile caps. No splices shall be permitted in the new steel without first submitting a diagram and obtaining the written approval of the Engineer. It is preferred that all steel run full length unspliced. The pay items for this work are identified as items 11 and 28 in the proposal and construction notes 17, 68, and 71 respectively in the plans.

2. Construction of Abutment Pile Caps

As shown on the plans and specified above, the abutment pile caps, except wingwalls, shall be constructed in a single pour to the lines and grades specified therein. The inside ends shall be joined to the existing pile cap by the existing wingwall steel extending a minimum of 24 inches into the new pile caps. The longitudinal steel shall run full length as specified for item VI (f)-1 except that dowels for the wingwalls shall be embedded as shown on the plans. The pay items for this work are identified as items 9 and 26 in the proposal and construction notes 15, 66, and 69 respectively in the plans.

3. Elastomeric Bearing Pads

Where shown on the plans or otherwise required, such as supporting pipe lines, elastomeric bearing pads shall be placed and furnished in accordance with Section 51-1.12 H of the State Standard Specifications. The bearing pads shall be 24 inches wide for the interior pile caps, and 18 inches wide for the abutment pile caps. The bearing pad material may run continuous for the length of the pile caps. Any discontinuous edges shall line up with the edges of the prestressed units. The variation in thickness specified in said Section 51-1.12 shall be interpreted as applying only over the width of the pad (24 or 18 inches) and the width of a prestressed unit (36 or 48 inches). If the thickness variation tolorances would be exceeded for a single thickness, additional thicknesses shall be used as required. Payment for furnishing and placing elastomeric bearing pads shall be considered to be included in those items for which it is associated.

4. Construction of Wingwalls

As shown on the plans and specified above, wingwalls shall be constructed to the lines and grades shown therein. If the wingwalls are constructed prior to pipe lines being installed, whether they are to be installed by the Contractor or their owners, blockouts shall be constructed as required. The pay items for this work are identified as items 10 and 27 in the proposal and construction notes 16, 67, and 70 respectively in the plans.

5. Construction of Integral Curb, Sidewalk, and Parapet Wall

As shown on the plans and specified above, integral curb, gutter, and parapet wall shall be constructed to the lines and grades shown therein. Expansion joints shall be provided to line up with the ends of the deck units, and the reinforcing steel shall be stopped 1-1/2 inches clear thereof. Payment for this work shall be on a unit price basis per lineal foot of curb, sidewalk, and parapet wall in place and is identified as items 13 and 31 in the proposal and construction notes 19 and 76 respectively in the plans.

(g) Precast, Prestressed Concrete Bridge Deck Units - This work consists of furnishing, placing, and joining the precast, prestressed concrete bridge deck units as shown on the plans and in accordance with Section 50 of the State Standard Specifications, and as specified herein.

Before casting any members, the Contractor shall submit to the Engineer for review, complete details, specifications, and drawings as specified in Section 50-1.01 of said State Standard Specifications, except that no particular size of said drawings, or microfilms are required.

Concrete shall have a minimum 28 day strength of 5,000 psi and all tendons shall meet the minimum yield and breaking strength requirement specified in Section 50-1.05 of said State Standard Specifications. All tendons shall be fully bonded to the concrete as specified in Section 50-1.09 of said State Standard Specifications. It is the intent that the 48 inch wide units be designed for H-20-44 truck loading per American Association of State Highway Officials' Standards and that all units be designed for the minimum design

VI (g)

Moments and prestress forces indicated on the plans.

Units shall be joined at center points to each other, and to the pile caps as detailed on the plans. All dry pack shall be of 1 to 3 cement-sand ratio. No loads shall be placed on units for a period of 72 hours after dry pack with cement mortar or 24 hours after pouring asphalt latex for end joints. As it is herein specified that new units shall be joined to existing units as specified for the new units; the bar ends of the existing units shall be located and exposed before proceeding with the manufacture of the new units. Existing curbs to removed shall be repaired prior to the completion of the project. Before placing the new units, all bolt holes, spalled concrete, etc., shall be plugged or patched to the satisfaction of the Engineer.

Payment for this work shall be on a unit price basis per unit in place and shall include furnishing, placing, bearing pads, miscellaneous hardware, joining, patching existing units, and all other associated work. The pay items are identified as items 12, 29, and 30 in the proposal and construction notes 18,72,73,74, and 75 respectively in the plans.

(h) Creosoted Timber Planks in Place - Creosoted timbers used to retain earth and placed behind the abutment piles shall be of "construction grade" Douglas Fir graded per Uniform Building Code Standard No. 25-3-64. Said timbers shall be pressure treated with creosote to retain not less than 8 pounds of creosote per cubic foot of wood. Timbers shall be spliced by butting the ends of the timbers at the center of a pile, lapping with a piece of the same creosoted planking not less than 2'-0" long, and securing with not less than four 60 d galvanized nails into each timber to be joined. Although the quantities listed in the proposal only include the timber required for the new bridge extension on Golden West Street, the Contractor is hereby advised that the quantity may be increasedd to include timbering behind the existing piling there also. The size of the timbers shall be 3" x 12" full dimension or "rough" timber. Payment for this work shall be on a unit price basis per lineal foot of timber plank in place, but shall not include extra material used in splices. It is identified as item 14 in the proposal and construction note 36 in the plans.

(i) Traffic Control and Detouring - This work shall consist of providing for, and maintaining provision for, public traffic through the construction area at all times, and such provisions shall be in accordance with Sections 4-1.04, 7-1.08, 7-1.09, and 7-1.12 of the State Standard Specifications with exception of the payment provisions and in accordance with the following special provisions.

The traffic flow over the Golden West Street Bridge is now approximately 6,600 cars per day and 7,200 cars per day over the Warner Avenue Bridge. For both bridges a minimum of two eleven foot travel lanes and one four foot pedestrian walkway, adequately lighted at night, with a handrail, barricade, or the existing chain link fence in place at all times. All equipment and signing shall be maintained to provice a clearance of five feet from the edge of the roadway intended for traffic use where possible. At the termination of the need for the detour, all equipment shall be removed and disposed of by the Conttactor in accordance with the applicable provisions of the State Standard Specifications.

VI (i)

The successful bidder shall submit, to the Director of Public Works, a plan delineating his proposal for the required detouring and the proposed warning and directional signing of the construction areas prior to commencing work. The Director of Public Works shall retain the right to change, add to, or delete from the plan indicating these proposals. A signed copy of this plan must be acquired prior to commencement of any work. Additional copies will be required, from the Contractor, for file copies and for the inspector assigned to this project. All signing shall be in accordance with Section 7-1.09 of the State Standard Specifications which refer to the current Manual of Warning Signs, Lights, and Devices for use in performance of Work Upon Highways issued by the Department of Public Works, Division of Highways, State of California. Except as provided for particular items of construction, no separate payment is intended for traffic control per se, and cost for this work should be included as overhead and spread over all other pay items of the contract.

SECTION VII

*Progress of Work and Time of Completion

The Contractor shall begin work within ten (10) days after receiving notice that the contract has been approved and shall diligently prosecute the same to completion before the expiration of 120 consecutive calander days including Saturdays, Sundays, legal holidays, and up to and including ten (10) working days (Mondays through Friday except holidays) of inclement or unsuitable weather.

*This Section is in lieu of Section 7 (b) of the General Requirements.

SECTION VIII

Construction within Waterway of Channel

Construction within the Waterway of the Orange County Flood Control Districts' Channel shall be in a manner such that storm or other waters may proceed uninterrupted along the existing drainage course, except that diversion of low flows may be permitted to protect construction in progress.

BY DRM DATE SUBJECT Structural Design SHEET NO. 1 OF 5

CHKD. BY DATE Warner Ave Bridge JOB NO.

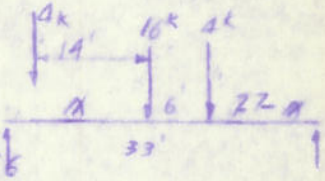
wt. of 4'-0" x 17" x 35'-0" Deck Units — 21.7 (unit) + 5.5 (3" pvmt) = 27.2 K max.

wt. of 3'-0" x 17" x 35'-0" Deck Unit — 16.7 (unit) + ½ (26.2) (sidewalk) = 29.8 K

Max Span N. abutment pile cap = 6'-10½" on skew = 6.83 @ 90°
Max Span S. abutment pile cap = 7'-6" on skew = 7.21 @ 90°
Max span N. Int. pile cap = 5'-11⅞" on skew = 4.83 @ 90°
Max span S. Int. pile cap = 5'-0" on skew = 4.81 @ 90°

N. overhang = 2'-0¾" + 5'-8¼" = 7'-9" on skew, = 1.92 + 5.33 = 7.25 @ 90°
S. Overhang = 2'-1¼" + 5'-6½" = 7'-7⅞" on skew, = 2.02 + 5.33 = 7.35 @ 90°

Loading H-20-44.



4'-0" x 17" x 35'-0" Deck Unit Design (Effective Span = 33')

Max. Moment $M_A = \left[\frac{33-X_{16}}{33}\cdot 16 + \frac{27}{33}\cdot 4 + \frac{A-2}{33}\cdot 4\right] A - 56.25\,A - 0.727A^2 \cdot \frac{1}{2}$

$dM/dA = 250 - 1.454A = 0,\ A = 172$

$L.L.+I = 1.30\left[\frac{15.8}{33}(16)(17.2) + \frac{9.3}{33}(4)(17.2) + \frac{27.8}{33}(17.2-14)4\right]12 = 2480$ "-K

$D.L. = 27.2\left(\frac{3^3}{8}\right)\left(\frac{33}{35}\right)12 = 1270$ "-K

Use 3763 "-K to agree with original plans

Least D.L. = $\frac{2127}{27.2}(1270) = 1010$ "-K

Max. Shear $L.L.+I = 1.30\left[16 + \frac{27}{33}(4) + \frac{13}{33}(16) + \frac{7}{33}(4)\right] = 34.4$ K

$D.L. = \frac{1}{2}(27.2)\left(\frac{33}{35}\right) = 12.8$

47.2 K

Properties w = 98", d = 17", A = 550 in², I = 17,780 in⁴

$Z_t = 2025$ in³, $r_t = 8.77$" $Z_b = 2160$ in³, $r_b = 8.23$"

35 - ⅜" cables, .085" ø, $A_s = 2.98$ in², $n = 2.75$", $d = 14.25$"

Check for 400 K design prestress force

Force/cable = 400/35 = 11,400 #, $f_{se} = 11,400/.085 = 134,000$ psi

Prestress/ultimate strength = 11,400/23,000 = 49.6% O.K. (<60%)

Prestress M = (8.23 - 2.75) 400 = 2190 "-K

Prestress comp. = 400(1000)/550 = 728 psi

Top conc. stress, least D.L. = $\frac{1010}{2025} - \frac{2190}{2025}(1000) + 728 = 185$ psi comp. O.K.

Bot. conc. stress, least D.L. = $-\frac{1010}{2160} - \frac{2190}{2160}(1000) + 728 = 1275$ psi comp O.K.

Top conc. stress, D.L. + L.L. = $\frac{3763}{2025} - \frac{2190}{2025}(1000) + 728 = 1507$ psi comp O.K.

Bot. conc. stress D.L.+L.L. = $-\frac{3763}{2160} - \frac{2190}{2160}(1000) + 728 = 0$ stress O.K.

Req'd 28 day conc. strength = 1507/.40 = 3760 psi Use 5000 psi conc.

Check Ultimate moment, bonded tendons

$p = \frac{2.95}{48(14.25)} = .00936$, $f_s' = 270{,}000$, $f_c' = 5000$ psi

$f_{su} = f_s'\left(1 - 0.5\frac{pf_s'}{f_c'}\right) = 238{,}000$ psi

$\frac{pf_{su}}{f_c'} = 0.208$ O.K. < .30 $\quad 1 - 0.6\frac{pf_{su}}{f_c'} = 0.875$

4' Deck Units, Cont'd)

$M_u = A_s f_{su} d\left(1 - 0.6 \frac{p f_{su}}{f'_c}\right) = 2.99(238{,}000)(14.25)(.875)/1000 = 8550^{\text{IN-K}}$

Reqd $M_u = 1.5\,D.L. + 2.5(L.L.+I) = 1.5(1270) + 2.5(2943) = 8130^{\text{IN-K}}$ } O.K.

shear

Reqd $V_u = 1.5(27.8) + 2.5(34.9) = 105.2^{K}$

$V_c = 180\, b\, jd = 180(48)(.9)(14.25) = 111^{K}$

Min steel ⌐¬ #3 @12" O.K. for shear reinforcement.

3'-0" x 17" x 35'-0" Deck Unit Design (Effective span = 33')

sidewalk live load/unit = $3(85)(35)/1000 = 8.95^{K}$

Max. Moment $L.L.+I = 1.30(8.95)\left(\frac{33}{8}\right)\left(\frac{33}{35}\right)12 = 543^{\text{IN-K}}$

$D.L. = 29.8\left(\frac{33}{8}\right)\left(\frac{33}{35}\right)12 = 1395^{\text{IN-K}}$

1936

3/4 of 4' value $= \frac{3}{4}(3787) = 2822^{\text{IN-K}}$ ← specify as design moment

D.L. without sidewalk $= 16.3/29.8(1393) = 810^{\text{IN-K}}$

Max. shear

$L.L.+I = 1.30\left(\frac{1}{2}\right)(8.95)\left(\frac{33}{35}\right) = 5.4^{K}$

$D.L. = \frac{1}{2}(29.8)\left(\frac{33}{35}\right) = 14.1$

19.5

3/4 of 4' value $= \frac{3}{4}(47.7) = 35.8^{K}$

Properties $W = 36^{\#}$, $d = 17"$, $A = 4.31^{\square"}$, $I = 17{,}400\ in^4$

$Z_t = 1520\ in^3$, $I/Z_t = 8.90"$ $Z_b = 1630\ in^3$, $I/Z_b = 8.20$

27 - 3/8" cables, .085 ea $A_s = 2.30^{\square"}$, $r = 2.75"$, $d = 14.25$

Check for 300 k design prestress force

Force/cable $= 300/27 = 11{,}100^{\#}$, $f_{so} = 11{,}100/.085 = 130{,}500$ psi

Prestress/ultimate strength $= 11{,}100/23{,}000 = 48.3\%$ O.K. (<60%)

Prestress $M = (8.20 - 2.75)300 = 1635^{\text{IN-K}}$

Prestress comp. $= 300(1000)/431 = 795$ psi

{ Top conc. stress, least D.L. $= \frac{810 - 1635}{1520}(1000) + 795 = 252$ psi comp
{ Bot. conc. stress least D.L. $= -\frac{810 - 1635}{1630}(1000) + 795 = 1300$ psi comp } O.K.

{ Top conc. stress, D.L.+L.L. $= \frac{2822 - 1635}{1520}(1000) + 795 = 1575$ psi comp
{ Bot. conc. stress D.L.+L.L. $= -\frac{2822 - 1635}{1630}(1000) + 795 = 67$ psi comp } O.K.

Reqd 28 day conc. strength $= 1575/.40 = 3940$ psi

Check Ultimate moment, bonded tendons Use 5000 psi concrete

$f_{su} = f_s\left(1 - 0.5 \frac{p f_s}{f'_c}\right) = 237{,}000$ psi $p = \frac{2.30}{35(14.25)} = .00498$ $f_s = 270{,}000$, $f'_c = 5000$

$p\frac{f_{su}}{f'_c} = 0.212$ O.K. (<.3) $1 - 0.6\frac{p f_{su}}{f'_c} = 0.873$

3' Deck Units (cont'd)

$M_u = A_s f_{su} d(1-0.6\frac{\rho f_{su}}{f'_c}) = 2.30(237{,}000)(14.25)(.873)/1000 = 6800''\text{-}k$

Req'd $M_u = 1.5\,D.L. + 2.5(L.L.+I) = 1.5(1393) + 2.5(1829) = 5662''\text{-}k$ } o.k.

Shear

Req'd $V_u = 1.5(14.1) + 2.5(21.7) = 75.9^k$

$V_c = 180\,b_w jd = 180(36)(.69)(10.25) = 83.5^k$

Min steel [ ] #3 @ 12" O.K. for shear reinforcement

Interior Pile Cap Design

Shear L.L.+I = $1.30\left[\frac{1}{35}(4) + \frac{15}{35}(16) + \frac{21}{35}(4) + 16 + \frac{29}{35}(4) + \frac{15}{35}(16) + \frac{2}{35}(4)\right]1.20 \times \frac{4.16 - 0.89}{5.16 - 1}$ (continuity & skew reduction) $= 45.0^k$

D.L. $= \left[\frac{1}{2}(3.83/4)(27.4) + \frac{1}{2}(2.83)(.75)\right]1.20 = 14.5$

59.5^k

Moment

Neg @ support

L.L.+I = $1.30[0.1 + 6.9 + 2.4 + 16 + 3.3 + 6.9 + 1.0]\frac{4.16}{4} = 49.5''\text{-}k$

D.L. = $\left[\frac{27.2}{7.55} + 0.75\right]\frac{(3.83)(4.16)}{10} = 12.0$

$61.5''\text{-}k$

Pos @ midspan

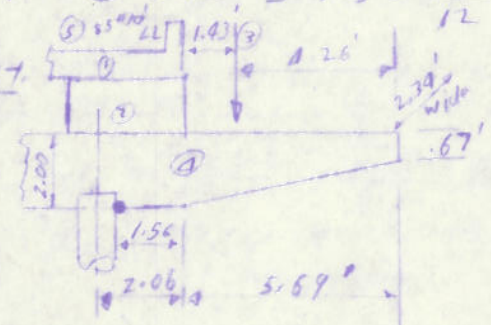
L.L.+I = $1.30(36.6)\left(\frac{4.16}{5}\right) = 39.6''\text{-}k$

D.L. = $7.55\,\frac{(3.83)(4.16)}{12} = 10.0$

$49.6''\text{-}k$

Values less than for Goldpan West Bridge

N. Pile Cap Ext.



item	wt calc.	wt	arm	M
①	$2.11(.062)(15.9)(.5)$	9100	.95	8,650 ''-k
②	$1.55/3(16.7)$	8670	.73	6310
③	Diff (.93 + .03) 35	6850	2.99	20,500
④	$(3.12 + .758)(1.33)(15)$	4120	3.14	12,940
Total pregat. DL.		28790		48,400
L.L. $(59)(85)(35)$		2660	.45	1200
		31400		49,600 ''-k
Fut pipes 2③		13,700	5.82	72,000
		45100		119,600 ''-k

Req'd $A_s = \frac{M}{1.96d} = \frac{119.6}{1.96(21)} = 3.90''$

(6-#8 = 4.70" provided)

Req'd $d = \sqrt{\frac{6M}{bf'_c}} = \sqrt{\frac{6 \cdot 119.6}{2.30(1.35)}} = 15.1$ (21" provided)

$v = \frac{V}{b\,jd} = \frac{45{,}100}{28.1(\frac{3}{8})(21)} = 88$ psi (stirrups not req'd < 90)

Req'd "d" @ 2.13' from end $= \frac{V}{bjv} = \frac{13700 + 700}{28.1(\frac{3}{8})\,90} = 6.5''$ d" provided = 11" O.K.

Negative moment capability of 6-#8 top bars

$= 1.96\,A_s d = 1.96(2.7)21 = 149''\text{-}k$

End Pile cap Design

Shear L.L.+I = $1.30\left[16 + \frac{27}{35}(9) + \frac{15}{16}(16) + \frac{9}{35}(9)\right]1.20 \times \frac{6.5-0.87}{7.5-1}$ = 36.8 K

(I; 27.2 wheel loads; continuity & skew reduction)

D.L. = $\left[\frac{1}{2}(6.21)(27.2) + \frac{1}{2}(6.21)(0.75)\right]1.20$ = 28.1

64.9 K

Moment neg. @ support

L.L.+I = $1.30\left[16 + 3.3 + 6.9 + 1.0\right]\frac{6.5}{4}$ = 57.4 ft-K

D.L. = $\left[\frac{1}{2}(27.2)\left(\frac{4.15}{9}\right) + 0.75\right]\frac{(6.21)(7.9)}{10}$ = 19.9 ft-K

76.8 ft-K

For all pile caps, use same structural section as for Golden West bridge (Design values slightly less)

Int Bent Pile Design

Uniform spacing of all piles @ 90° to ℄ = 4.83'

Wheel closest to a pile = $\frac{4.83-2}{4.83} \times 2 = 1.172$ wheel load coeff.

For 10' av. truck spacing = $\frac{4.83}{10} \times 2 = 0.965$ wheel load coeff

L.L. = 1.172 (36.6) (1.1) = 47.0 K

D.L. { Pile cap, pvmt, units = 7.55 (4.83) = 36.9
{ wt. Pile (16" conc) = 11.8

94.6 K

[Based on Av. 38.5 K: 36.9 + 11.8 = 86.2 K]

End Bent Pile Design

Max. av spacing of 2 most widely spaced piles @ 90° to ℄ = $\frac{1}{3}(7.21 + 6.01) = 6.61$

L.L. = $\left(\frac{7.21-2}{7.21} + \frac{6.01-2}{6.01}\right)(27.2)(1.1)$ (1.391) = 41.8 K

D.L. { Pile cap, pvmt, units = 6.61 (4.15) = 27.4
{ wt. Pile (16" conc) = 11.8

81.0 K

Average pile spacing @ 90° to ℄ = $\frac{38.4}{6}$ = 6.4

Average truck spacing = 10'-0"

L.L. = $\left(\frac{6.4}{10}\right)(2)(27.2)(1.1)$ = 38.4

D.L. { Pile cap, pvmt, units = 6.4 (4.15) = 26.6
{ wt. Pile (16" conc.) = 11.8

76.8 K

Outside End Bent Pile @ S.W.

(Assume, 1/2 pt @ 2nd pile)

Refer to p. 7

Water line	(8.63/5.16) 6850	= 11.5 K
pile cap ext.	(9.54/5.16) 2,660	= 4.9
Pile Cap	(3.36/5.16)(6.72)(.703)	= 3.1
Deck Units	(3.36/5.16) $\frac{6.72}{3}$ (16.7)	= 24.4
sidewalk	(4.08/5.16) (26.2)	= 20.7
wt. Pile (16" conc)		11.8
Fut. Pipe lines	(10.78/5.16) 13,700	= 28.6

105.0 K D.L.

L.L. sidewalk = $\frac{3.09}{4.83}(6.09)\frac{(85)(35)}{1000}$ = 11.5 L.L.

116.5 K

BY ..... DATE ..... SUBJECT Warner Bridge, cont'd SHEET NO. 5 OF 5

CHKD. BY ..... DATE ..... JOB NO. .....

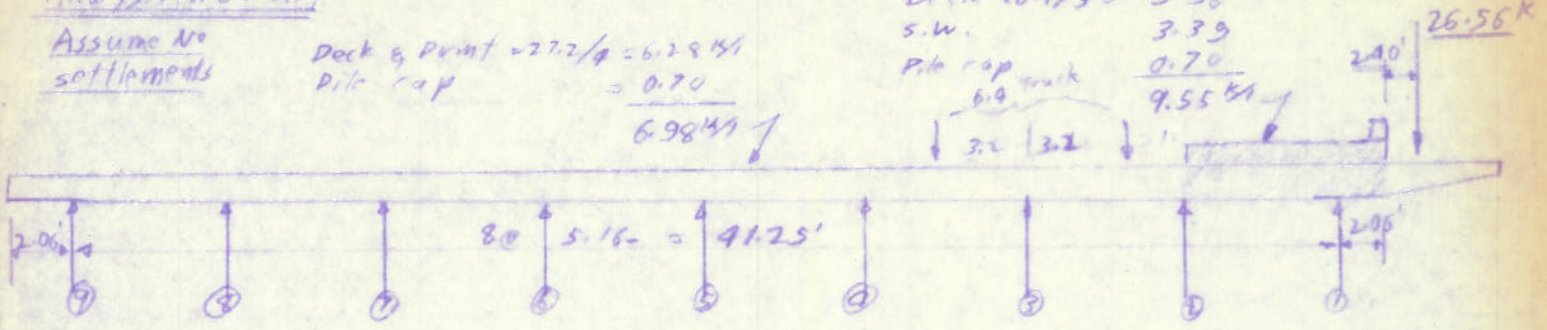
Make Precise check of reactions to piles by moment distribution

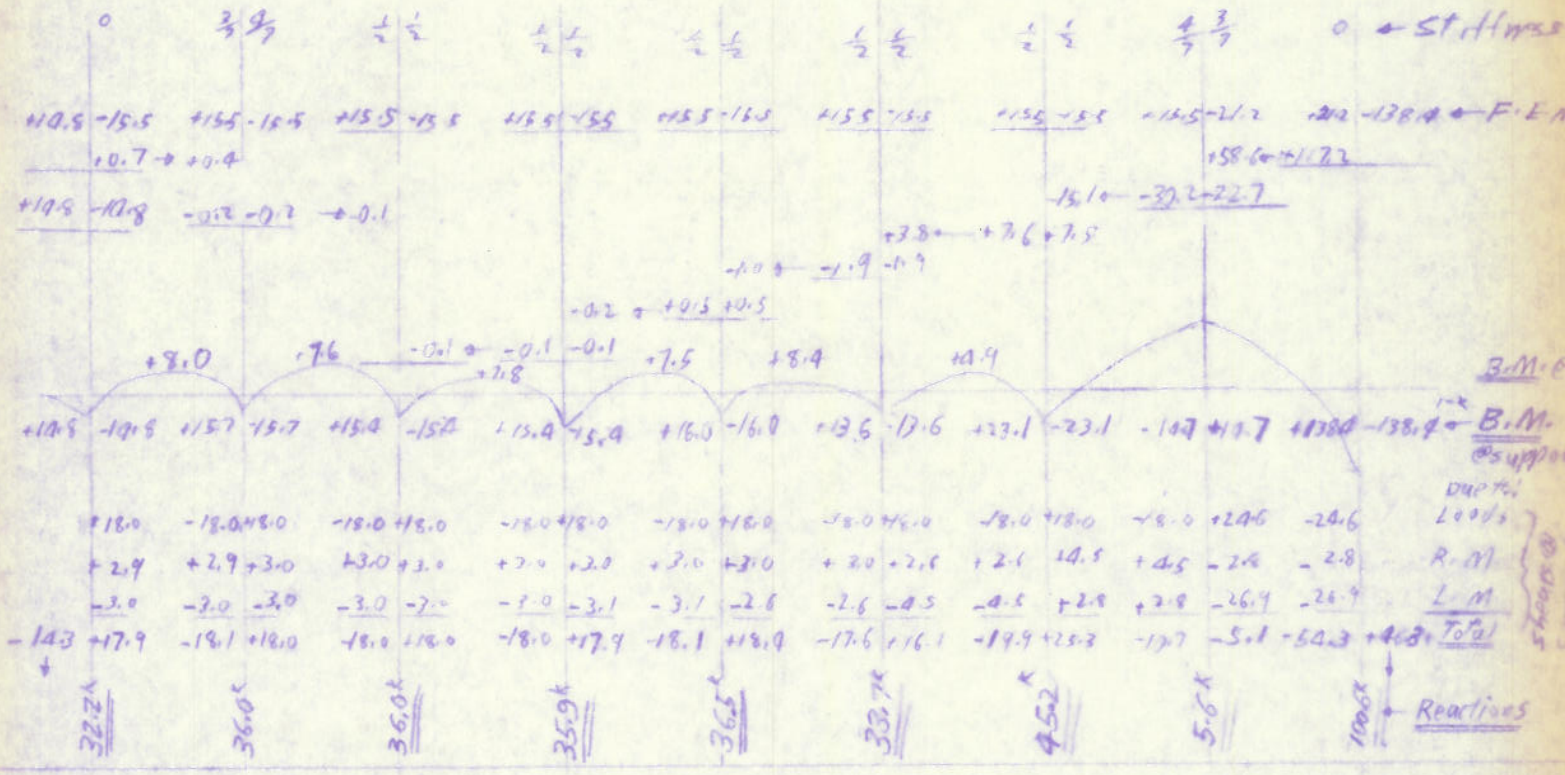
Analysis for DL only

Assume No settlements

Deck & Paint = 27.2/4 = 6.28 k/l
Pile cap = 0.70
6.98 k/l

Deck 16.7/3 = 5.56 k/l
S.W. 3.39
Pile cap 0.70
9.55 k/l





Parapet → 3350 × 0.33 = − 1100
water → 6850 × 1.93 = 9,780
Pile cap ext → 2660 × 2.38 = 6350
Fut Lines → 13,700 × 3.56 = 48,800
26,560 × 2.40 = 63,830

$M_{①} = 26.56(9.96) = 138.4'^{k}$

FEM ①② $= \frac{5.16^2}{12}(9.56) = 21.2'^{k}$, ×1.5 = 31.8 '^k

FEM ②③ $= \frac{5.16^2}{12}(6.98) = 15.5'^{k}$ ×1.5 = 23.2 '^k

$M_{④} = 6.98\left(\frac{2.06}{2}\right)^2/2 = 14.8'^{k}$

Pile	D.L.	wt. Pile	Total D.L.	L.L.	L.L. + D.L.	
②⑧ & Typ.	36.0	11.8	47.8	42.9	90.7 k	specify 45 tons
③	45.2	11.8	57.0	30.6	87.6 k	specify 45 tons
①	100.6	11.8	112.4	12.3	124.7 k	specify 62 tons

see Sht 4: 1.172(36.6) [disregard continuity factor]
sidewalk only: 85(1.56 + 2.55) 55/1000
2 (1.75/5.11)(36.6)(1.1)

For pile strength calcs, see Gen calcs.

BY DRM DATE 8/26/63 SUBJECT Quantity & Cost Estimate - Goldenwest St. & Warner Ave. Bridges SHEET NO. 1 OF 1

CHKD. BY ____ DATE ____ JOB NO. ____

Subsection Sec II, sparks

Item No	Description	Constr Notes	Quantity	Unit Price	Total
(a)1	1. Construction & removal of oil Line support structures	1.6	Lump Sum		$1,000.00
(a)2	2. 12" waterline to be relocated.	(2)	Lumpsum		1,300.00
(a)4	3. 5' Chain Link fence to be relocated.	(11)	Lump sum		400.00
(a)7	4. Guard rail removal.	(12)	Lumpsum		200.00
(a)5	5. Removal of exist pile cap projections	(20)	2 each	150.00	300.00
(a)6	6. Removal of existing wingwalls	(22)	4 each	50.00	200.00
(e)	7. Furnishing of reinforced concrete piling	(14)	1504 L.F.	5.00	7520.00
(e)	8. Driving of reinforced concrete piles	(14)	34 each	300.00	10,200.00
(f)2	9. construction of abutment pile caps.	(15)	4 each	450.00	1,800.00
(f)8	10. Construction of wingwalls.	(16)	4 each	100.00	400.00
(f)1	11. construction of center pile caps.	(17)	2 each	500.00	1,000.00
(g)	12. Prestressed concrete deck units in place (4'-0" x 33'-0").	(18)	32 each	1056.00	33,792.00
(f)5	13. Construction of integral curb, sidewalk and parapet wall	(19)	132 L.F.	10.00	1,320.00
(h)	14. 3"x12" creosoted timber planks in place	(36)	260 L.F.	1.00	260.00
	TOTAL FOR GOLDEN WEST STREET BRIDGE				$58,112.00
(a)3	20. 18" waterline to be relocated.	(54)	Lumpsum		$4,000.00
(a)4	21. 5' chain Link fence to be relocated	(57)	Lump sum		1,200.00
(a)7	22. Guard rail removal	(58)	Lump sum		400.00
(a)6	23. Removal of existing wing walls	(77)	4 each	50.00	200.00
(e)	24. Furnishing of reinforced concrete piling	(65)	4600 L.F.	5.00	23,000.00
(e)	25. Driving of reinforced concrete piling	(65)	82 each	300.00	24,600.00
(f)2	26. Construction of abutment pile caps	(69)(69)	4 each	620.00	2,480.00
(f)4	27. Construction of wingwalls	(67)(70)	4 each	50.00	200.00
(f)1	28. Construction of interior pile caps	(68)(71)	6 each	660.00	3960.00
(g)	29. Prestressed concrete deck units in place (4'-0" x 35'-0")	(72)(75)	72 each	1120.00	80,690.00
(g)	30. Prestressed concrete deck units in place (3'-0" x 35'-0")	(73)(74)	16 each	840.00	13,440.00
(f)3	31. Construction of integral curb, sidewalk, and parapet wall	(76)	280 L.F.	10.00	2,800.00
	TOTAL FOR WARNER AVE BRIDGE				$156,920.00
	TOTAL FOR CONTRACT				$215,032.00
	Payment to Standard Oil Co. For relocation of 3 pipelines				$6,000.00
	TOTAL COST FOR PROJECT				$221,032.00

Deck units @ 80¢/sq. ft.
Reinforced Conc. & Conc. @ 50.00 c.y.
& Steel 15¢/lb

Struct. Design Golden West bridge

DRM 4/18/67

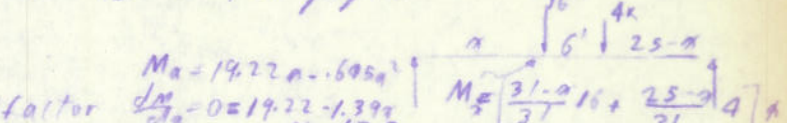
wt. of 4'-0" x 17" x 33'-0" Deck units — Unit 20.6 k + 3" Pmtl 4.8 = 25.4 k

Max span abutment pile cap = 7'-8"

Max span interior pile cap = 5'-10"

Overhang 2'-2" + 5'-6" for pipes

Loading H-20-44



Deck Unit Design (Effective span 31") — Max Moment — impact factor

$L.L.+I = 1.30\left[\frac{17.2}{31}(16) + \frac{11.8}{31}(4)\right](13.8)(12) = +2210''\text{-}k$

$D.L. = 25.0 + \frac{3}{8} + \frac{3}{38} \times 12 = +1120 \times \frac{20.6}{25.0} = 910''\text{-}k$

$3330''\text{-}k$

Use $3044''\text{-}k$ design moment to agree with original plans.

Max. shear

$LL+I = 1.30\left[16 + \frac{25}{31}(4) + \frac{11}{31}(16) + \frac{5}{31}(4)\right] = 33.1^k$

$D.L. = \frac{1}{2}(25.0)\frac{31}{33} = 11.9$

45.0^k

Properties

w = 48" d = 17" A = 550" I = 17,780"⁴

$Z_T = 2025\ in^3$, $\frac{I}{Z_T} = 8.77"$ $Z_B = 2160\ in^3$, $\frac{I}{Z_B} = 8.23"$

33 - 3/8" cables .085" ea, A = 2.62"

Check for 363k design prestress force

Force/cable = 363/33 = 11,000#, stress = 11,000/.085 = 130,000 psi = f_{se}

Prestress/ultimate strength = 11,000/23,000 = 48% O.K. (< 60%)

Prestress M = -(8.23 - 2.62)363 = -2040"k

Prestress Comp. = 363(1000)/550 = 660 psi

Top Conc. Stress, least D.L. = $-\frac{910 - 2040}{2025}(1000) + 660$ = 102 psi comp. O.K.

Bot. Conc. stress, least D.L. = $-\frac{910 - 2040}{2160} + 660$ = 1183 psi comp. O.K.

Top Conc. stress, DL+LL = $\frac{3044 - 2040}{2025}(1000) + 660$ = 1359 psi Comp. O.K.

Bot. Conc. stress DL+LL = $-\frac{3044 - 2040}{2160}(1000) + 660$ = +10 psi comp. O.K.

Reqd 28 day conc. strength = 1359/.40 = 3400 psi Use 5000 psi conc.

Pile Cap Design Interior — Shear

$LL+I = 1.30\left[\frac{13}{33}(16) + \frac{19}{33}(4) + 16 + \frac{27}{33}(4) + \frac{13}{33}(16) + \frac{7}{33}(4)\right]$ (35.1 wheel loads) $1.20 \times \frac{4.83 - 0.83}{5.83 - 1}$ (continuity) = 45.5k

$DL = \left[\frac{1}{2}(4.83/4)(25.4) + \frac{1}{2}(4.83)(.75)\right]1.20$ = 20.6k

66.1k

Moment

neg @ support

$LL+I = 1.30[6.3 + 2.3 + 16.0 + 3.3 + 6.3 + 0.9]\frac{4.83}{4}$ = 55.0'-k

$DL = \left[\frac{25.4}{4} + 0.75\right]\frac{4.83^2}{10}$ (7.08) = 16.5

71.5'-k

Pos @ Midspan

$LL+I = 1.30(35.1)\left(\frac{4.83}{5}\right)$ = 44.0

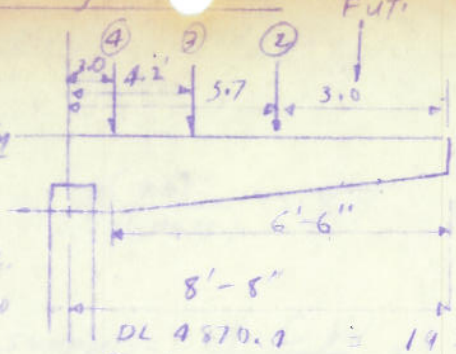
$DL = 7.08\frac{4.83^2}{16}$ = 13.7

57.7'-k

Goldpark West Bridge (cont'd)

M & V

Pile cap - Extension



Assume (due to balance) D.L. & L.L. of deck units go directly to pile

④ 6" oil = 33 (19 + 12) = 1030
③ 8" gas = 33 × (45) = 1480
② 12" water = 33 (68 + 98) = 3830
6440#

DL 4870.1 = 19.5 ↓
④ 1030 × 3 = 3100 '-#
③ 1480 × 4.2 = 6200
② 3830 × 5.7 = 21,200
Fut 4000 × 7.2 = 28,900
V = 15,310#
68,900 '-# = M

M & V

Pile cap

End

shear L.L.+I = 1.30 [16 + (27/33)(9) + (13/33)(6) + (7/33)(2)] 1.20 × (6.83 − .83)/(7.83 − 1) = 36.3 K

(26.5: wheel loads; impact; community, clear span)

D.L. = [½(6.83/9)(25.9)(½) + ½(6.83)(.75)] 1.20 = 16.0 / 52.3 K

(10.8: units; 2.56: pile cap)

Max. Moment

Neg. @ Support:
L.L.+I = 1.30 [16 + 3.3 + 6.3 + 0.9] 6.83/9 = 58.7 '-K
DL = [½(25.9/9) + .75] 6.83²/10 = 18.3 / 77.0 '-K

(26.5; 3.22)

Pos. @ Midspan:
L.L.+I = 1.30 (26.5)(6.83/5) = 47.0
DL = 3.42 (6.83)²/12 = 15.5 / 62.5 '-K

End Pile cap Design: +M = 77.0 '-K, −M = 62.5 '-K, V = 52.3 K, b = 2.50', f'c = 3000 psi

fc = 1350 psi
μ = 300 psi bot
μ = 210 psi top
v = 240 psi with stirrups
v = 90 psi without

Req'd − d = √(6M/bfc) = √(6 × 77.0 / 2.5 × 1.35) = 11.7" — 21" provided

Req'd + d = √(6M/bfc) = √(6 × 62.5 / 2.5 × 1.35) = 11.1" — Provide 20.5"

Req'd − As = M/1.96d = 77.0/1.96(21) = 2.5 □" — 6 - #8 bars = 4.7 □" provided

Req'd + As = M/1.96d = 62.5/1.96(20.5) = 2.1 □" — 4 - #8 bars = 3.14 □' provided

Bond & shear for interior pile cap V = 66.1 K

Bottom u = V/Σo j d = 66.1 K × 1000 / 12.56 × 7/8 × 20.5 = 294 psi, < 300 — 4 - #8 bars O.K.
*(Actual V causing Max + M is somewhat less)

Top u = V/Σo j d = 66.1 × 1000 / 18.94 × 7/8 × 21 = 190 psi, < 300, 6 - #8 bars O.K.

v = V/b j d = 66.1 × 1000 / 30 × 7/8 × 20.5 = 123 psi, stirrups req'd

Goldenwest Bridge (cont'd)

Stirraps

Max spacing for #4 = $\frac{2(.20)}{30(.0015)} = 8.9''$ Use 9"

spacing @ supports for #4 = $\frac{A_v f_y d}{V'} = \frac{2(.20)(24{,}000)(\frac{7}{8})(20.5)}{\frac{123-90}{90}(66{,}100)} = 5.95$ Use 6"

V' for 9" spacing = $\frac{5.95}{9} \times 22{,}200 = 16{,}000^{\#} + 24{,}200 = 40{,}200 = V$

dist from support = $\left(1 - \frac{40{,}200}{66{,}100}\right)\frac{6.83}{2} \times 12 = 16''$

Pile Cap Extension

$A_s = \frac{M}{ad} = \frac{49.4}{1.46(21)} = 1.6^{\square''}$ 4 - #8 = $3.14^{\square''}$ @ 6'-6" from end

at 3' from end $d = 5'' + \frac{3}{6.5}(21-5) = 12.4$ $A_s = \frac{30.5}{1.46(12.4)} = 1.7$

Int Bent

Max. av. spacing of 2 most widely spaced piles = $\frac{1}{2}(5'-10'' + 4'-6'') = 5'-2''$

Pile Design

$LL = \left(\frac{5.83-2}{5.83} + \frac{4.5-2}{4.5}\right)(35.1)(1.1)$ (1.272 ~ continuity effect) $= 47.0^{K}$

D.L. { Pile cap, Pumt, Units = 7.08 (5.17) = 36.6
{ wt. Pile (16" conc) = 42 (208 = 8.7^K

92.3^K for max. spacing

Average pile spacing = $\frac{46'-9 - 18'-9}{6} = 4'-8''$ Average Truck spacing = 10'-0"

L.L. = $\frac{4.67}{10}(2)(35.1)(1.1)$ (~ continuity effect) = 36.0"

D.L. { Pile cap, Pumt, Units = 7.08(4.67) = 33.1
{ wt Pile (16" conc.) = 6.7

77.8^K for average spacing

End Bent

Pile Design

Average spacing = 7'-0" Average truck spacing = 10'-0"

L.L. = $\frac{7}{10}(2)(26.5)(1.1)$ = 40.8^K

D.L. { Pile cap, Pumt, Units = 7(3.92) = 27.4
{ wt. pile (16" conc) = 9.5

77.7^K

specify 62 tons (124^K) for outside interior bent piles (see warner Bridge rules.

Specify 45 tons (90^K) for all other piles this bridge

(Seismic Design cont'd)

Ast Piles alone cannot carry EQ. + DL forces, diaphragm action to end piles must be considered

Allowable $e = \left(\frac{173}{95} - 1\right)\frac{12}{5.8} = 5.9''$

Allowable E.Q. carried by piles $= \left(\frac{5.9}{19.6}\right)3.0 = \underline{1.2^{k}}$

Remainder carried by Deck $= 3.0 - 1.2 = \underline{1.8^{k}}$ for center ½ bridge
for each pile in center bent

Shear @ Abutment Pile caps in Deck Units per unit

$= \pm (1.2)\left(\frac{7}{8}\right) + \frac{1}{2}\left(25.0 + \frac{20}{8}\right).067 = .53 + 1.01 = \underline{1.54^{k} \text{ per unit}}$

(± From center pile cap; Deck unit; from curb; Seismic factor)

For ¾" Dowels shear stress $= \frac{1540}{.99} = \underline{3500 \text{ psi}}$, O.K.

For 9" embedment, bearing stress $= \frac{1540}{9(7.5)} = \underline{257 \text{ psi}}$ O.K.

Soil can take entire deck shear in friction on pile cap (even neglecting pile shear resistance and end bearing) $f = \frac{1.54 + 9(7.5).067}{4(2+2.5)} \times 1000 = \underline{97 \text{ psf soil friction}}$ (1.54)

Also, if pins were not provided, friction would also transfer shear from deck units to pile caps as req'd

For Warner Ave bridge the forces would be more than twice as great, but by inspection, the end pile caps should be able to take all forces by diaphragh action to the end abutment pile caps, and thence into the ground.

Assume interior pile caps carry themselves:

End shear/unit for deck units only $= 2\left(21.7 + \frac{30}{10.5} + 5.3\right).067 = \underline{4.0^{k}/\text{unit}}$ (sidewalk, 3" cant)

Friction to pile cap, $u = \frac{4.0}{25.0} = \underline{.16}$ (Pile cap)

Friction to Earth $= \frac{4.0 + 3.0(.067)}{4(2+2.5+1.2)} \times 1000 = \frac{4204}{22.4} = \underline{183 \text{ psf}}$ (unit)
Neglecting End bearing
Pile shear resistance.

Or if Piles alone carried all forces by shear

V per pile $= \frac{10.5}{7}(4200) = 6330^{\#}$, $v = \frac{V}{A} = \frac{6330}{113} = \underline{56 \text{ psi av. shear on conc.}}$

Therefore, it should be obvious that, one way or another, the end bents can carry the E.Q. forces into the ground.

Goldenwest Bridge (cont'd)

Deck Units (cont'd)

Ultimate Moment. Bonded $f_{su} = f_s\left(1 - 0.5\frac{pf_s'}{f_c'}\right) = 240{,}000$ psi

Unbonded $f_{su} = f_{se} + 15{,}000 = 145{,}000$ psi

$d = 14.38"$

$A_s = 33(.085) = 2.81$

$f_s' = \frac{23{,}000}{.085} = 270{,}000$ psi

$p = \frac{2.81}{48(14.38)} = .00406$

$M_u = A_s f_{su} d\left(1 - 0.6\frac{pf_{su}}{f_c'}\right) = 404\frac{f_{su}}{1000}\left(1 - .6\frac{pf_{su}}{f_c'}\right)$ in-kips $f_c' = 5000$ psi, $f_{se} = 130{,}000$ psi

Bonded $M_u = 8550$ "-k $\quad p\frac{f_{su}}{f_c'} = .1950$ O.K

Unbonded $M_u = 5050$ "-k $\quad p\frac{f_{su}}{f_c'} = .1175$ O.K $\Big\} < .30$

Reqd $M_u = 1.5(1120) + 2.5(2329) = 7490$ "-k

Reqd $V_u = 1.5(11.9) + 2.5(33.1) = 99.7^k$

$V_c = 180 b_w d = 180(48)(.90)(.438)/1000 = 111^k$

Min. steel ⌐ #3 @ 12" O.K. for shear reinforcement

All tendons must be bonded to provide adequate safety factor.

Check Existing type of piles

Vertical Load $\begin{cases} D.L. & 45^k \\ L.L. & 45^k \end{cases}$ 90^k

ℓ = 42' @ 5' into cap, 8.5' open, 33' into earth. for center bent. consider short column

Determine seismic moment $EQ = KCD$ $k = .67$, $C = \frac{.05}{\sqrt[3]{T}}$ $T = .32\sqrt{D_p}$

For fixity 10' below ground $P = 3\Sigma(EI)\frac{\Delta}{\ell_3} = \frac{3(2{,}339{,}000)1"}{(18.5)^3} = 1100^{\#}$ each pile for 1" def.

$I_{conc} = \frac{\pi(12)^4}{64} = 1017.9$ in^4, $\times 2{,}900{,}000/1728 = 1{,}710{,}000$

$I_{steel} = \frac{\pi(12.3.586)^4}{64} - 1017.9 = 37.7$, $\times \frac{29{,}000{,}000}{1728} = 629{,}000$

$2{,}339{,}000$

$T = .32\sqrt{\frac{1100}{45{,}000}} = .0502$ sec, $C = \frac{.05}{\sqrt[3]{.0502}} = .135$, Use .10

$EQ = 0.67(.10)(45)$ 3.0^k per pile

Seismic Moment $= 3.0(18.5) = 55.5^{k'}$

Allowable vert Load (without moment) & discounting steel shell

$P = .225 f_c' A_g + f_s A_s$ $\quad .225(3000) = 675$ psi

$A_g = 113.1$ $\quad A_s = 2.69$, $p = .0239$, $f_s = 20{,}000$

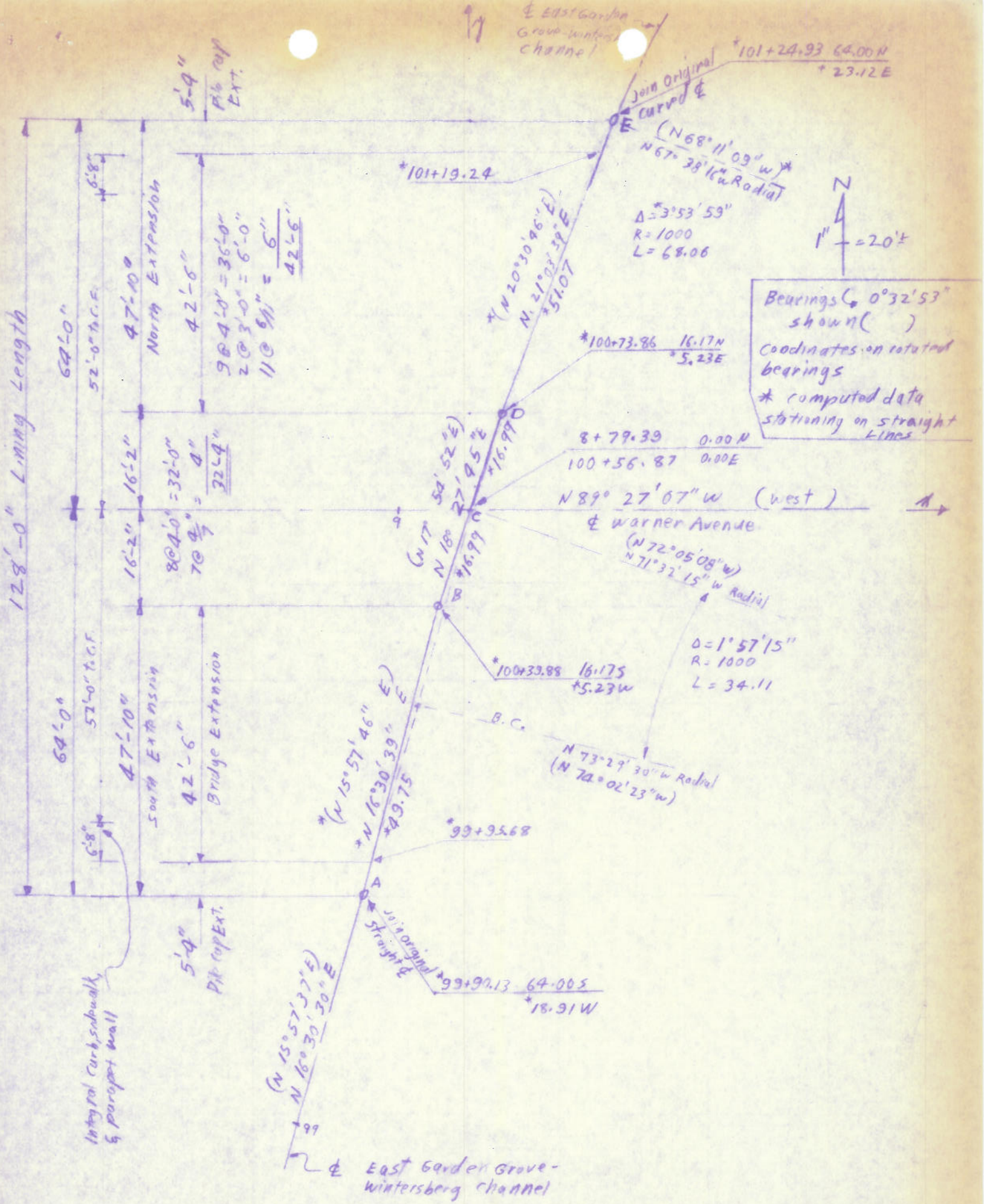
$76.5^k + 52.9 = 129.4^k$

Per State: $\left[\frac{1}{2}(10-1).0239 = 1.21\right] = 107^k$ for vertical load only $< 90^k$ O.K

Approx Check for 45^k D.L. + 55.5'-k moment & discounting shell

$e = \frac{55.5}{45} \times 12 = 14.8"$ Equivalent $P = 45^k\left(1 + \frac{5.8(14.8)}{12}\right) = 366^k$ .0239 USC

Allowable Equivalent $P = 129.4(1.33) = 173^k$



WARNER AVE BRIDGE STATIONING & LAYOUT DATA (1) of 6

WARNER AVE. BRIDGE LAYOUT DATA

POINT	BEARING	DIST	COS.	SIN.	N	S	E	W	y	x
C									0.00	0.00
Rad. Pt.	(S 72°05'08"E)	1000.00	.30759651	.95151689		307.5965	951.5169		-307.5965	951.5169
	(N 74°02'23"W)	1000.00	.27497086	.96145256	274.9709			961.4526		
Tan. Pt	(S 15°57'37"W)	*32.6323	→			31.3744		8.9729	- 32.6256	- 9.9357
A	*(N 15°57'46"E)	*49.7517	.96144036	.27501350	47.8333		13.6824		- 64.00	- 18.9086
B	(N 17°54'52"E)	*16.9905	.95151689	.30759651	16.1667		5.2262		-16.1667	-5.2262
C	(S 72°05'08"E)	1000.00							0.00	0.00
Rad. Pt.	*(N68°11'09"W)	1000.00	.37153650	.92839434	371.5965			928.3943	-307.5965	+951.5169
E	*(S 20°30'46"W)	* 51.0715	.93659406	.35041626		47.8333		17.8964	+ 64.00	+ 23.1226
D									+16.1667	+ 5.2262

Project stationing vs. old stationing (channel)

Point	Project station	old station	Dist. from ℄ warner	Warner Ave. sta
A	99+90.13	99+90.13	64'-0" south	8+98.30
Tan. Pt (or B.C.)	Not on Line	100+22.76	32.6256 south	8+89.33
B	100+39.88	Not on curve	16'-2" south	8+82.62
C	100+56.87	100+56.87	0'-0"	8+79.39
D	100+73.86	Not on curve	16'-2" North	8+74.16
E	101+24.93	101+24.93	64'-0" North	8+56.27

Channel section Data

All sideslopes 2/1 S = .000276 bottom slope

Bottom width 70.00' (35' each side ℄)

Roadway widths 15'

Right of way widths 196' (98' each side ℄)

Top dike elev. 10.0

F.L. @ Pt. A. -1.66
F.L. @ Pt. B -1.65
F.L. @ Pt. C -1.65
F.L. @ Pt. D -1.64
F.L. @ Pt. E -1.63

Use -1.65 throughout

Dike height = 11.65

Shelf elev. = 8.50

Shelf height = 10.15

At right angle		Skew angles 15°57'46"	17°54'52"	20°30'46"
℄ to bottom channel wall	= 35.00	36.40	36.78	to fit curve ahead
℄ to inside roadway	= 58.30	60.64	61.27	62.25
℄ to outside roadway	= 73.30	76.24	77.03	78.26
℄ to shelf edge	= 55.30	57.52	58.12	To fit curve ahead

Length inside span = 35'-1"

Length outside span = 34'-6½"

℄ to outside piles = 69'-7½"

℄ to edge deck units = 70'-1½"

℄ to edge pile cap = 70'-10½"

Extension Deck widths = 42'-6"		44.2045	45.3772
Station of bridge ends		99+95.68	101+19.24

COORDINATES FOR WARNER AVE BRIDGE

EXTREME limits of bridge corners

Point	Rotated Bearing	Dist	Cos	Sin	N or S	E or W	y	x	Warner 1 Sta
N.W. new cap cor.							+58.6667	-49.7479	9+29.14
101+19.29	East	70.875			0	+70.875	+58.6667	+21.1271	
N.E. new cap Cor.	East	70.875			0	+70.875	+58.6667	+92.0021	7+87.39
101+19.29							+58.6667	+21.1271	8+58.26
100+73.86	S 20°30'46"W	45.3772	.93639406	.35041626	-42.50	-15.9009	+16.1667	+5.2262	8+74.16
N.W. old cap cor.							+16.1667	-65.6488	9+45.04
100+73.86	East	70.875			0	+70.875	+16.1667	-5.2262	
N.E. old cap cor.	East	70.875			0	+70.875	+16.1667	+76.1012	8+03.
S.W. old cap cor.							-16.1667	-76.1012	9+55.49
100+39.88	East	70.875			0	+70.875	-16.1667	-5.2262	
S.E. old cap cor.	East	70.875			0	+70.875	-16.667	+65.6488	8+13.74
S.W. new cap Cor	East	70.875			0	+70.875	-58.6667	-88.2580	9+67.65
99+95.68	East	70.875			0	+70.875	-58.6667	-17.3830	
S.E. new cap cor.							-58.6667	+53.4920	8+25.90
100+39.88							-16.1667	-5.2262	8+84.62
99+95.68	S 15°57'46"W	44.2045	.96144036	.27501356	-42.50	-12.1568	-58.6667	-17.3830	8+96.77

Shelf edge living corners

Point	Rotated Bearing	Dist	Cos	Sin	N or S	E or W	y	x	Warner 1 Sta
N.W. lin Cor.	East	*59.3173			0	+59.3173	+64.0000	-36.1947	9+15.58
101+24.93	EaST	*59.8472			0	+59.8472	+64.0000	+23.1226	8+56.2
N.E. Lin Cor.							+64.0000	+82.9698	7+96.42
N.W. con Cor	East	58.1177			0	+58.1177	+16.1667	-52.8915	9+32.28
100+73.86	East	58.1177			0	+58.1177	+16.1667	+5.2262	
N.E. con. Cor.							+16.16667	+63.3439	8+16.05
S.W. con Cor.	East	58.1177			0	+58.1177	-16.1667	-63.3439	9+42.73
100+39.88	East	58.1177			0	+58.1177	-16.1667	-5.2262	
S.E. con. Cor.							-16.1667	+52.8915	8+26.50
S.W. lin Cor.	East	57.5179			0	+57.5179	-64.0000	-76.4265	9+55.82
99+90.13	East	57.5179			0	+57.5179	-64.0000	-18.9086	8+98.30
S.E. lin. Cor.							-64.0000	+38.6097	8+40.78

(3) of 6

COORDINATES FOR WARNER AVE. BRIDGE (Cont'd)

Point	Rotated Bearing	Dist	Cos.	Sin	N. or S.	E. or W.	N	E	Warner Sta.
Bottom lining corners									
N.W. Lin Cor.							+64.0000	-14.4754	8+93.87
101+24.93	East	*37.5980			0	-37.5980	+64.0000	+23.1226	
N.E. Lin Cor.	East	*37.8096			0	+37.8096	+62.0000	+60.9322	8+18.46
N.W. con. Cor.							+16.1667	-31.5572	9+10.35
100+73.86	East	36.7834			0	+36.7834	+16.1667	+5.2262	
N.E. con. Cor.	East	36.7834			0	+36.7834	+16.1667	+42.0096	8+37.38
S.W. con Cor.							-16.1667	-42.0096	9+21.40
101+39.88	East	36.7834			0	+36.7834	-16.1667	-5.2262	
S.E. Con. Cor.	East	36.7834			0	+36.7834	-16.1667	-31.5572	8+47.8
S.W. Lin Cor.							-64.0000	-55.3172	9+34.71
99+90.13	East	36.4037			0	+36.4037	-64.0000	-18.9386	
S.E. con. Cor.	East	36.4037			0	+36.4037	-64.0000	+17.5000	8+61.89
Ends of bridge deck or ℄ int bents									
N.W. new int bent							+58.6667	-13.9562	8+37.35
101+19.24	East	35.0833			0	+35.0833	+58.6667	+21.1271	
N.E. new int bent	East	35.0833			0	+35.0833	+58.6667	+56.2104	8+23.18
N.W. old int. bent							+16.1667	-29.8571	9+09.25
100+73.86	East	35.0833			0	+35.0833	+16.1667	+5.2262	
N.E. old int bent	East	35.0833			0	+35.0833	+16.1667	+40.3095	8+39.09
S.W. old int bent							-16.1667	-40.3095	9+19.70
100+39.88	East	35.0833			0	+35.0833	-16.1667	-5.2262	
S.E. old int bent	East	35.0833			0	+35.0833	-16.1667	+29.8571	8+49.53
S.W. new int bent							-58.6667	-52.4663	9+31.86
99+95.68	East	35.0833			0	+35.0833	-58.6667	-17.3830	
S.E. new int bent	East	35.0833			0	+35.0833	-58.6667	+17.7003	8+61.69

WARNER AVENUE BRIDGE PILE & DECK LAYOUT DATA

(All stationing & distances measured on skew)

DESCRIPT.	DECK WIDTH	SKEW ANGLE	SKEW WIDTH	END BENTS @ 69'-7½" E'ly & W'ly						INTERIOR BENTS @ ℄ & 35'-1" E'ly & W'ly						
				NO. PILES	CHANNEL STATION	SPACING	CUT-OFF ELEV. W'ly	CUT-OFF ELEV. E'ly	TIP ELEV.	NO. PILES	CHANNEL STATION	SPACING	CUTOFF ELEV. W'ly	CUTOFF ELEV. ℄	CUTOFF ELEV. E'ly	TIP ELEV.
(65) NORTH EXTENSION	42'-6"	20°30'46"	45'-4½"	—	101+19.24	2'-0 3/4"	North	end of	bridge	—	101+19.24	2'-0 3/4"	North	end of	bridge	
				2	101+17.17	6'-10½"	7.39	7.02	-49	3	101+17.17	5'-1 7/8"	7.51	7.58	7.33	-52
				2	101+10.30	6'-10½"	7.46	7.15	-49	3	101+12.02	5'-1 7/8"	7.58	7.65	7.42	-48
				2	101+03.42	6'-10½"	7.53	7.28	-49	3	101+06.86	5'-1 7/8"	7.65	7.72	7.51	-48
				2	100+96.55	6'-10½"	7.60	7.41	-49	3	101+01.70	5'-1 7/8"	7.72	7.79	7.60	-48
				2	100+89.67	6'-10½"	7.67	7.50	-49	3	100+96.55	5'-1 7/8"	7.78	7.85	7.69	-48
				2	100+82.80	6'-10½"	7.74	7.67	-49	3	100+91.39	5'-1 7/8"	7.85	7.92	7.78	-48
				2	100+75.92	2'-0 3/4"	7.81	7.80	-49	3	100+86.23	4'-8"	7.92	7.99	7.87	-48
				—	100+73.86		End of exist		bridge	3	100+81.57	4'-8"	8.00	8.07	7.95	-48
										3	100+76.90	3'-0½"	8.05	8.12	8.03	-48
										—	100+73.86		End of exist		bridge	
EXISTING BRIDGE	32'-4"	17°54'52"	33'-11 3/4"	—	100+73.86	1'-11 7/8"	End of exist		bridge	—	100+73.86	1'-11 7/8"	End	of exist	bridge	
				(2)	101+71.87	7'-6"	(8.02)	(8.02)	(-49)	(3)	100+71.87	5'-0"	(8.24)	(8.31)	(8.24)	(-48)
				(2)	100+64.37	7'-6"	(8.02)	(8.02)	(-49)	(3)	100+66.87	5'-0"	(8.24)	(8.31)	(8.24)	(-48)
				(2)	100+56.87	7'-6"	(8.02)	(8.02)	(-49)	(3)	100+61.87	5'-0"	(8.24)	(8.31)	(8.24)	(-48)
				(2)	100+49.37	7'-6"	(8.02)	(8.02)	(-49)	(3)	100+56.87	5'-0"	(8.24)	(8.31)	(8.24)	(-48)
				(2)	101+41.87	1'-11 7/8"	(8.02)	(8.02)	(-49)	(3)	100+51.87	5'-0"	(8.24)	(8.31)	(8.24)	(-48)
				—	100+39.88		End	of exist	bridge	(3)	100+46.87	5'-0"	(8.24)	(8.31)	(8.24)	(-48)
										(3)	101+41.87	1'-11 7/8"	(8.24)	(8.31)	(8.24)	(-48)
										—	100+39.88		End	of exist	bridge	
(65) SOUTH EXTENSION	42'-6"	15°57'46"	44'-2½"	—	100+39.88	2'-1¼"	End of exist		bridge	—	100+39.89	2'-1¼"	End	of exist	bridge	
				2	101+37.78	6'-3"	7.78	7.84	-49	3	100+37.78	5'-0"	8.05	8.15	8.06	-48
				2	100+31.53	6'-3"	7.67	7.76	-49	3	100+32.78	5'-0"	7.97	8.08	7.99	-48
				2	100+25.28	6'-3"	7.56	7.68	-49	3	100+27.78	5'-0"	7.88	8.01	7.92	-48
				2	100+19.03	6'-3"	7.46	7.61	-49	3	100+22.78	5'-0"	7.80	7.94	7.85	-48
				2	100+12.78	7'-6"	7.35	7.53	-49	3	100+17.78	5'-0"	7.71	7.86	7.78	-48
				2	100+05.28	7'-6"	7.22	7.44	-49	3	100+12.78	5'-0"	7.63	7.79	7.72	-48
				2	99+97.78	2'-1¼"	7.09	7.35	-49	3	100+07.78	5'-0"	7.54	7.72	7.65	-48
				—	99+95.68		South	end of	bridge	3	99+02.78	5'-0"	7.46	7.65	7.58	-48
										3	99+97.78	2'-1¼"	7.37	7.58	7.51	-52
										—	99+95.68		South	end of	bridge	

Specified bearing exist piles = 40 tons

Reqd all proposed piles except outside interior bents at pile cap extensions = 45 tons

Outside interior bents at pile cap extensions = 62 tons.

COORDINATES FOR WARNER AVE. BRIDGE

Point	Rotated Bearing	Dist.	Cos	Sin	N. or S.	E. or W.	y	x	Warner's Sta
N. W'ly R/W Cor.	*S 70°26'25"E	1098.00	.33478734	.94229371	-367.5965	+1034.6385	+ 60.0000	- 83.1216*	9+62.50
*Rad. Pt.	N 65°57'00"W	902.00	.40753492	.91318963	+367.5965	- 823.6970	- 307.5965	+ 951.5169	
Fut. N'Ely R/W Cor.							+ 60.0000	+ 127.8199*	7+51.57
Ex. NEly R/W Cor.	*N 68°01'14"W	902.00	.37427550	.92731756	+337.5965	- 836.4404	+ 30.0000	+ 115.0765*	7+64.31
Fut. S.W'ly R/W Cor.	S 74°02'23"E	98.00	.27497086	.96145256	- 26.9471	+ 94.2224	- 60.0000	- 113.6938*	9+99.08
Pt. on ℄ R/W	N 15°57'37"E	*23.8671			+ 22.9471	+ 6.5628	- 86.9471	- 25.4714	
99+90.13	N 15°57'37"E	* 32.1879			+ 30.9471	+ 8.8507	- 69.0000	- 18.9086	
Pt. on ℄ R/W	S 74°02'23"E	98.0000			- 26.9471	+ 94.2224	- 33.0529	- 10.0579	
Fut. S.E.ly R/W Cor.							- 60.0000	+ 84.1645 *	7+95.23
Ex. S.W.ly R/W Cor.	S 74°02'23"E	98.00			- 26.9471	+ 94.2224	- 30.0000	- 111.1139 *	9+90.50
Pt. on ℄ R/W	S 15°57'37"W	* 7.3357			- 7.0529	- 2.0171	- 56.9471	- 16.8915	
99+90.13	N 15°57'37"E	* 63.3906			+ 60.9471	+ 17.4306	- 64.0000	- 18.3086	
Pt. on ℄ R/W	S 74°02'23"E	98.00			- 26.9471	+ 94.2224	- 3.0529	- 1.4780	
Ex. S.E.ly R/W Cor.							- 30.0000	+ 92.7444 *	7+86.65
N'wly Lin. shaft Cor.	*S 69°22'58"E	1055.30	.35212402	.93595335	- 371.5965	+ 987.7116	+ 64.0000	- 36.1947*	
Rad. Pt.	*N 66°50'13"W	944.70	.39334868	.91938937	+ 371.5965	- 868.5471	- 307.5965	+ 951.5169	
NEly Lin shaft Cor.							+ 64.0000	+ 82.9698*	
N'wly bet. Lin Cor	*S 58°57'38"E	1035.00	.35903043	.93332589	- 371.5965	+ 965.9923	+ 64.0000	- 14.4754*	
Rad. Pt.	*N 67°21'06"W	365.00	.38507403	.92288566	+ 371.5965	- 890.5847	- 307.5965	+ 951.5169	
NEly Lin Cor.							+ 64.0000	+ 60.9322 *	

AH. Lin. Corners to ℄ Curve

ORANGE COUNTY FLOOD CONTROL DISTRICT

JUN 6 1967

No. C05.72
Permit No. 05767

Mr. James R. Wheeler
Director of Public Works
City of Huntington Beach
P. O. Box 190
Huntington Beach, California

COPY

Dear Sir:

Enclosed is your completed copy of a permit for the widening of the Warner Avenue and Golden West Street bridges over district's East Garden Grove - Wintersburg Channel.

Very truly yours,

C. R. Nelson
Senior Civil Engineer

RDB/dmt

Encl.

ORANGE COUNTY FLOOD CONTROL DISTRICT

RDB

MAY 31 1967

No. CO5.72
Permit No. 05767

Honorable Board of Supervisors
Orange County Flood Control District
Santa Ana, California

SUBJECT: Proposed permit to City of Huntington Beach for widening of Warner Avenue and Golden West Street within district's East Garden Grove - Wintersburg Channel (District No. 2)

COPY

Gentlemen:

Enclosed are three copies of a proposed permit to the City of Huntington Beach for reconstruction and widening of the existing Warner Avenue and Golden West Street bridges within district's East Garden Grove - Wintersburg Channel.

The construction plans and specifications have been carefully reviewed by district's staff to preclude interference with district's operations and ultimate improvements.

The permit has been approved by the County Counsel's office and executed by the Director of Public Works for the City of Huntington Beach.

RECOMMENDATION: Approve Permit.

Respectfully submitted,

H. G. Osborne, Chief Engineer

RDB/dmt

Encl.

ORANGE COUNTY FLOOD CONTROL DISTRICT

RDB

No. C05.72
Permit Application
No. 05767

MAY 18 1967

Mr. James R. Wheeler
Director of Public Works
City of Huntington Beach
P. O. Box 190
Huntington Beach, California

COPY

Dear Sir:

Enclosed are three copies of a proposed permit for the widening of the Warner Avenue and Golden West Street bridges over district's East Garden Grove - Wintersburg Channel. Noted on the enclosed check print are modifications requested by this office.

Please execute and return all copies of the permit to this office along with three prints and a reproducible copy of the construction plans.

Very truly yours,

C. R. Nelson
Senior Civil Engineer

RDB/dmt

Encl.

C05.72

CITY OF HUNTINGTON BEACH

ENGINEERING DEPARTMENT
Huntington Beach, California

May 22, 1967

Orange County Flood Control District
P. O. Box 1078
Santa Ana, California

Attention: Mr. C. R. Nelson

Reference: Your file No. C05.72
Permit Application
No. 05767

Gentlemen:

Enclosed are three sets of the revised plans and specifications for the "widening of the prestressed concrete bridges over the east Garden Grove-Wintersburg Channel at Golden West Street and at Warner Avenue", together with one set of sepias of said plans, and three copies of our signed permit application.

Very truly yours,

James R. Wheeler

James R. Wheeler
Director of Public Works

JRW:DRM:mp

enclos.

RECEIVED
MAY 23 1967
ORANGE COUNTY
FLOOD CONTROL DIST.

C05.72

CITY OF HUNTINGTON BEACH

ENGINEERING DEPARTMENT

Huntington Beach, California

May 11, 1967

H. G. Osborne
Orange County Flood Control District
P.O. Box 1078
Santa Ana, California

Subject: Warner Avenue& Goldenwest St.
Bridges at C05 Channel
CC-064 A.H.F.P. No. 280 & 284

Dear Mr. Osborne:

Transmitted herewith are three (3) copies of the proposal and special provisions for the subject project to accompany the plans previously sent.

Due to their being standard for all jobs, we have deleted the general requirements, however, if you so desire we will furnish copies of them also.

Very truly yours,

James R. Wheeler
Director of Public Works

By H E Hartge
H. E. Hartge
Deputy Director of Public Works

JRW:HEH:DWK:ae

Trans.

CITY OF HUNTINGTON BEACH

ENGINEERING DEPARTMENT

Huntington Beach, California

May 9, 1967

H. G. Osborne
Orange County Flood Control District
P.O. Box 1078
Santa Ana, California

Subject: Warner Ave. & Goldenwest St.
Bridges at O.C.F.C.D. C5 Channel
CC-064 A.H.F.P. No. 380 & 384
Phase I

Dear Mr. Osborne:

Transmitted herewith are three (3) copies of the improvement plans to construct additions, extensions, and widen the existing subject bridges. The bridges are under two A.H.F.P. street projects, however, we are going to advertise both bridges together as Phase I of the projects with the street construction phase following by approximately two months.

Our tentative date to furnish the newspaper the Notice Inviting Sealed Bids is May 23 with bids due to be opened on June 5th.

We realize this is a rather short notice, however, we have not been able to complete the plans earlier due to the project approval dates.

We will appreciate your review, comments, and permission to advertise. The specifications are being typed and will be delivered to you this week.

Very truly yours,

James R Wheeler

James R. Wheeler
Director of Public Works

JRW:DWK:ae

Trans.

Co5. 72

CITY OF HUNTINGTON BEACH

ENGINEERING DEPARTMENT
Huntington Beach, California

April 5, 1967

Orange County Flood Control District
P.O. Box 1078
Santa Ana, California

Gentlemen:

Enclosed are two (2) copies of each of the nearly completed plans of the Goldenwest bridge widening over the East Garden Grove-Wintersburg Channel and also the preliminary plans of the Warner Avenue bridge widening.

Please review these plans at your earliest convenience, and return one copy of each with your required revisions or corrections, if any.

Very truly yours,

James R Wheeler

James R. Wheeler
Director of Public Works

JRW:DRM:ace

Encl.

ORANGE COUNTY FLOOD CONTROL DISTRICT

JWS

FEB 7 1967

No. C05.23

04162

Mr. James R. Wheeler
Director of Public Works
City of Huntington Beach
P. O. Box 190
Huntington Beach, California

Dear Sir:

COPY

Reference is made to your proposed widening of bridges over the East Garden Grove-Wintersburg Channel (Facility No. C05) at Warner Avenue and at Golden West Street.

The Warner Avenue crossing of the C05 channel is at a location of poor soils conditions and of very nominal channel slope. These factors combined with the current review of the project by the Corps of Engineers indicate that it would be most desirable to delay any channel lining under the bridge until a future date.

Channel protection under the existing bridge at Golden West Street consists of rock rip rap. This rip rap has not proven satisfactory and may be removed by district forces. Due to the backwater condition created by the low invert elevation and nominal downstream channel slope and also considering the non-erosive character of the soils, it is probably satisfactory to presently eliminate channel lining under the bridge.

Very truly yours,

H. G. Osborne, Chief Engineer

JWS/gp

C05.21

CITY OF HUNTINGTON BEACH

ENGINEERING DEPARTMENT

Huntington Beach, California

February 1, 1967

Orange County Flood Control District
P.O. Box 1078
Santa Ana, California

Attention: Mr. H. G. Osborne, Chief Engineer

Subject: Warner Ave. Bridge Widening

Dear Sir:

Enclosed herein are two (2) copies of dimensional calculations for the Warner Avenue bridge widening. Please review these at your earliest convenience and return one copy with your corrections or modifications so that this office may proceed with the design.

Very truly yours,

James R Wheeler

James R. Wheeler
Director of Public Works

JRW:DRM:ace

Encl.

RECEIVED
FEB 3 1967
ORANGE COUNTY
FLOOD CONTROL DIST.

C05. 21

CITY OF HUNTINGTON BEACH

ENGINEERING DEPARTMENT

Huntington Beach, California

January 16, 1967

H. G. Osborne, Chief Engineer
Orange County Flood Control District
P.O. Box 1078
Santa Ana, California

Dear Mr. Osborne:

This office is in the process of preparing plans for the widening of bridges over the C05 channel at Golden West Street and Warner Avenue. It is intended that each bridge be widened to the full width of each ultimate right of way i.e., Golden West Street 100 feet and Warner Avenue 120 feet.

The purpose of this letter is to inform you of our intention to perform this work and secondly to determine whether the District would desire to enter into a betterment agreement to install the channel lining under the bridges. Your early reply regarding this would be appreciated so that we may incorporate that detail in the design.

Very truly yours,

James R Wheeler

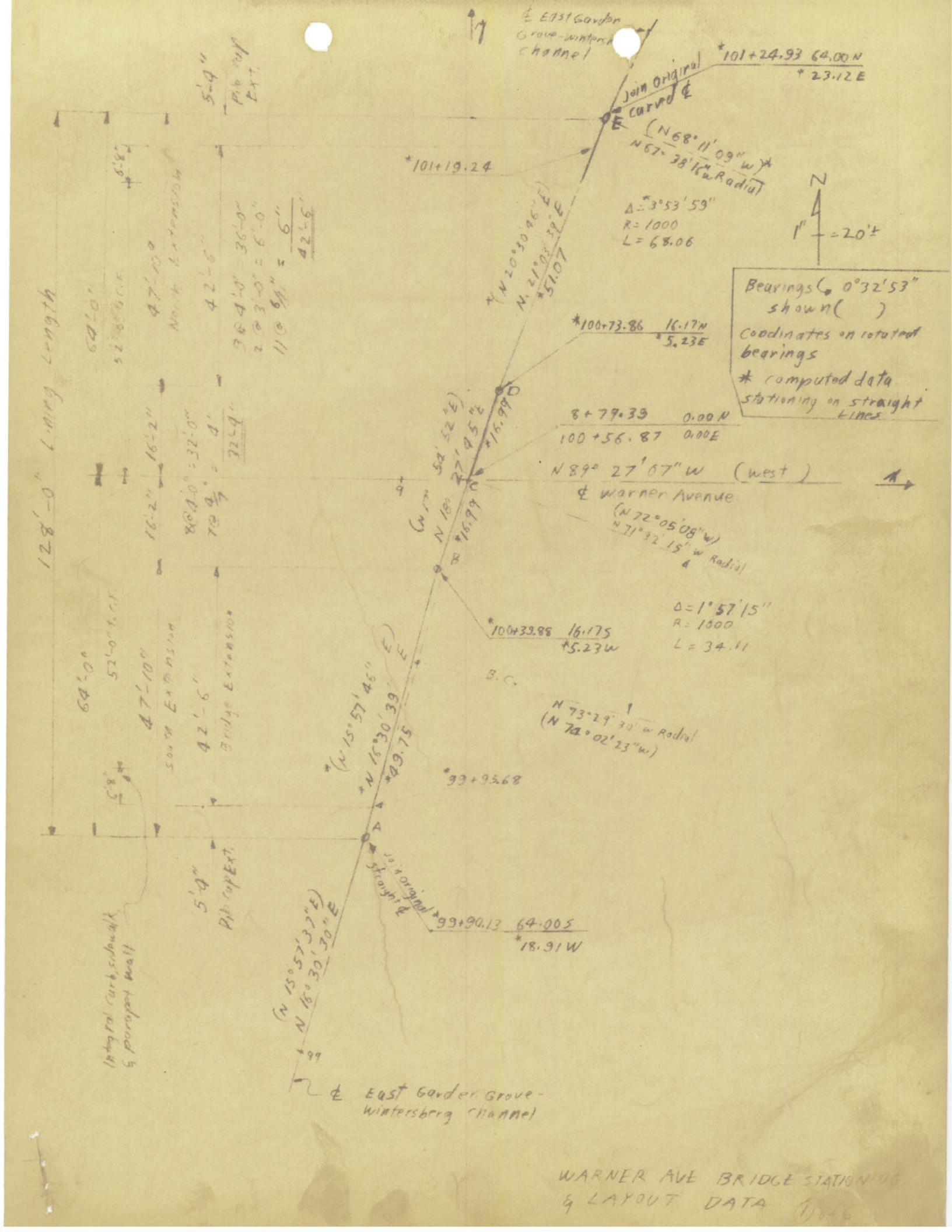
James R. Wheeler
Director of Public Works

JRW:HEH:ace

RECEIVED

JAN 18 1967

ORANGE COUNTY
FLOOD CONTROL DIST.



WARNER AVE BRIDGE STATIONING & LAYOUT DATA 1 of 6

WARNER AVE. BRIDGE LAYOUT DATA

POINT	BEARING	DIST	COS.	SIN.	N	S	E	W	N	E
C									0.00	0.00
Rad. Pt.	(S 72°05'08"E)	1000.00	.30739651	.95156894		307.5965	951.5169		-307.5965	951.5169
	(N 74°02'23"W)	1000.00	.27497086	.96145256	274.9709			961.4526		
Tan Pt	(S 15°57'37"W)	*32.6323				31.3744		8.9729	- 32.6256	- 9.9357
A	*(N 15°57'46"E)	*49.7517	.96144036	.27501350	47.8333		13.6824		- 64.00	- 18.9086
B	(N 17°54'52"E)	*16.9905	.95156894	.30739651	16.1667		5.2262		- 16.1667	- 5.2262
C	(S 72°05'08"E)	1000.00							0.00	0.00
Rad. Pt.	*(N 68°11'03"W)	1000.00	.37159650	.92839434	371.5965			928.3943	-307.5965	+951.5169
E	*(S 20°30'46"W)	* 51.0715	.93659406	.35041626		47.8333		17.8964	+ 64.00	+ 23.1226
D									+16.1667	+ 5.2262

Project stationing vs. old stationing (channel)

Point	Project Station	Old Station.	Dist. from ℄ Warner	Warner Ave. Sta.
A	99+90.13	99+90.13	64'-0" south	8+98.30
Tan. Pt. (or B.C.)	Not on Line	100+22.76	32.6256 south	8+89.33
B	100+39.88	Not on curve	16'-2" south	8+80.62
C	100+56.87	100+56.87	0'-0"	8+79.39
D	100+73.86	Not on curve	16'-2" North	8+74.16
E	101+24.93	101+24.93	64'-0" North	8+56.27

Channel section Data

All sideslopes 2/1 S = .000276 bottom slope

Bottom width 70.00' (35' each side ℄)

Roadway widths 15'

Right of way widths 196' (98' each side ℄)

Top dike elev. 10.0

F.L. @ Pt. A.	-1.66
F.L. @ Pt. B	-1.65
F.L. @ Pt. C	-1.65
F.L. @ Pt. D	-1.64
F.L. @ Pt. E	-1.63

Use -1.65 throughout

Dike height = 11.65

Shelf height = 10.15

Shelf elev. = 8.50

At right angle	=	Skew angles 15°57'46"	17°54'52"	20°30'46"
℄ to bottom channel wall	= 35.00	36.40	36.78	To fit curve ahead
℄ to inside roadway	= 58.30	60.64	61.27	62.25
℄ to outside roadway	= 73.30	76.24	77.03	78.26
℄ to shelf edge	= 55.30	57.52	58.12	To fit curve ahead

Length inside span = 35'-1"

Length outside span = 34'-6½"

℄ to outside pile = 69'-7½"

℄ to bridge deck units = 70'-1½"

℄ to edge pile cap = 70'-10½"

Extension Deck widths = 42'-6"	44.2045		45.3772
Station of bridge ends	99+95.68		101+19.24

COORDINATES FOR WARNER AVE BRIDGE

Extreme limits of bridge corners

Point	Rotated Bearing	Dist	Cos	Sin	N or S	E or W	y	x	Warner & Sta.
N.W. new cap cor.							+58.6667	-49.7479	9+29.14
101+19.29	East	70.875			0	+70.875	+58.6667	+21.1271	
N.E. new cap Cor.	East	70.875			0	+70.875	+58.6667	+92.0021	7+87.39
101+19.29							+58.6667	+21.1271	8+58.26
100+73.86	S 20°30'46"W	45.3772	.93659406	.35041626	-42.50	-15.9009	+16.1667	+5.2262	8+74.16
N.W. old cap cor.							+16.1667	-65.6488	9+45.04
100+73.86	East	70.875			0	+70.875	+16.1667	+5.2262	
N.E. old cap cor.	East	70.875			0	+70.875	+16.1667	+76.1012	8+03.29
S.W. old cap cor.							-16.1667	-76.1012	9+55.49
100+39.88	East	70.875			0	+70.875	-16.1667	-5.2262	
S.E. old cap cor.	East	70.875			0	+70.875	-16.667	+65.6488	8+13.74
S.W. new cap Cor.							-58.6667	-88.2580	9+67.65
99+95.68	East	70.875			0	+70.875	-58.6667	-17.3830	
S.E. new cap cor.	East	70.875			0	+70.875	-58.6667	+53.4920	8+25.90
100+39.88							-16.1667	-5.2262	8+84.62
99+95.68	S 15°57'46"W	44.2045	.96144036	.27501350	-42.50	-12.1568	-58.6667	-17.3830	8+96.77

Shelf edge lining corners

N.W. lin Cor.							+64.0000	-16.1947	9+15.58
101+24.93	East	*59.3173			0	+59.3173	+64.0000	+23.1226	8+56.2
N.E. Lin Cor.	EAST	+59.8472			0	+59.8472	+64.0000	+82.9698	7+96.42
N.W. con Cor							+16.1667	-52.8915	9+32.28
100+73.86	East	58.1177			0	+58.1177	+16.1667	+5.2262	
N.E. Con. Cor.	East	58.1177			0	+58.1177	+16.16667	+63.3439	8+16.05
S.W. con Cor.					0		-16.1667	-63.3439	9+42.73
100+39.88	East	58.1177			0	+58.1177	-16.1667	-5.2262	
S.E. Con. Cor.	East	58.1177				+58.1177	-16.1667	+52.8915	8+26.50
S.W. lin Cor.							-64.0000	-76.4265	9+55.82
99+90.13	East	57.5179			0	+57.5179	-64.0000	+18.9086	8+98.30
S.E. lin. Cor.	East	57.5179			0	+57.5179	-64.0000	+38.6037	8+40.78

COORDINATES FOR WARNER AVE. BRIDGE (cont'd)

	Point	Rotated Bearing	Dist.	Cos.	Sin	N. or S.	E. or W.	y	x	Warner & Sta.
Bottom lining corners	N.W. Lin Cor.	East	*37.5980			0	.37.5380	+64.0000	-14.4754	8+93.87
	101+24.93	East	*37.8096			0	+37.8036	+64.0000	+23.1226	
	N.E. Lin Cor.							+64.0000	+60.9322	8+18.46
	N.W. con. Cor.	East	36.7834			0	+36.7834	+16.1667	-31.5572	9+10.35
	100+73.86	East	36.7834			0	+36.7834	+16.1667	+5.2262	
	N.E. con. Cor.							+16.1667	+42.0096	8+37.38
	S.W. con. Cor.	East	36.7834			0	+36.7834	-16.1667	-42.0096	9+21.40
	101+39.88	East	36.7834			0	+36.7834	-16.1667	-5.2262	
	S.E. Con. Cor.							-16.1667	-31.5572	8+47.8
	S.W. lin Cor.	East	36.4037			0	+36.4037	-64.0000	-55.3172	9+34.71
	99+90.13	East	36.4037			0	+36.4037	-64.0000	-18.9086	
	S.E. con. Cor.							-64.0000	+17.5000	8+61.89
Ends of bridge deck & ℄ int bents	N.W. new int bent	East	35.0833			0	+35.0833	+58.6667	-13.9562	8+93.35
	101+19.24	East	35.0833			0	+35.0833	+58.6667	+21.1271	
	N.E. new int bent							+58.6667	+56.2104	8+23.18
	N.W. old int. bent	East	35.0833			0	+35.0833	+16.1667	-29.8571	9+09.25
	100+73.86	East	35.0833			0	+35.0833	+16.1667	+5.2262	
	N.E. old int bent.							+16.1667	+40.3095	8+39.08
	S.W. old int bent	East	35.0833			0	+35.0833	-16.1667	-40.3095	9+19.70
	100+39.38	East	35.0833			0	+35.0833	-16.1667	-5.2262	
	S.E. old int bent							-16.1667	+29.8571	8+49.53
	S.W. new int bent	East	35.0833			0	+35.0833	-58.6667	-52.4663	9+31.86
	99+95.68	East	35.0833			0	+35.0833	-58.6667	-17.3830	
	S.E. new int bent							-58.6667	+17.7003	8+61.69

COORDINATES FOR WARNER AVE. BRIDGE

Point	Rotated Bearing	Dist.	Cos	Sin	N or S.	E or W.	Y	X	Warner ℄ Sta
N. W'ly R/W Cor.	*S. 70°26'25"E	1098.00	.33978734	.94229371	-367.5965	+1034.6385	+ 60.0000	- 83.1216*	9+62.51
*Rad. Pt.	N 65°57'00"W	902.00	.40753492	.91318963	+367.5965	- 823.6970	- 307.5965	+ 951.5169	
Fut N'Ely R/W Cor.							+ 60.0000	+127.8199*	7+51.57
Ex. N'Ely R/W Cor.	*N68°01'14"W	902.00	.37427550	.92731756	+337.5965	- 836.4404	+ 30.0000	+115.0765*	7+64.31
Fut. S.W'ly R/W Cor.	S 74°02'23"E	98.00	.27497086	.96145256	- 26.9471	+94.2224	-60.0000	+119.6938*	9+99.08
Pt on ℄ R/W	N 15°57'37"E	*23.8671			+ 22.9471	+ 6.5628	- 86.9471	- 25.4714	
99+90.13	N 15°57'37"E	* 32.1879			+ 30.9471	+ 8.8507	- 64.0000	- 18.3086	
Pt. on ℄ R/W	S 74°02'23"E	98.0000			- 26.9471	+94.2224	-33.0529	-10.0579	
Fut. S.E.'ly R/W Cor.							-60.0000	+84.1645 *	7+95.27
Ex. S.W.'ly R/W Cor.	S 74°02'23"E	98.00			- 26.9471	+94.2224	- 30.0000	- 111.4138 *	9+90.50
Pt. on ℄ R/W	S 15°57'37"W	* 7.3357			- 7.0529	- 2.0171	- 56.9471	- 16.8915	
99+90.13	N 15°57'37"E	* 63.3906			+ 60.9471	+ 17.4306	- 64.0000	- 18.3086	
Pt. on ℄ R/W	S 74°02'23"E	98.00			- 26.9471	+94.2224	- 3.0529	- 1.4780	
Ex. S.E.'ly R/W Cor.							-30.0000	+92.7444 *	7+86.65
Aft. Lin. Corrtes to fit Curve									
N'wly Lin. shift Cor.	*S 69°22'58"E	1055.30	.35212404	.93595335	-371.5965	+987.7116	+64.0000	- 36.1947*	
Rad. Pt.	*N 66°50'13"W	944.70	.39334868	.91938937	+371.5965	-868.5471	- 307.5965	+ 951.5169	
N Ely Lin shift Cor.							+64.0000	+ 82.9698*	
N'wly Ext. Lin Cor	*S 58°57'34"E	1035.00	.35903043	.93332589	-371.5965	+965.9923	+ 64.0000	- 14.4754*	
Rad. Pt.	*N 67°2'06"W	965.00	.38507409	.92288566	+371.5965	-890.5847	- 307.5965	+ 951.5169	
N Ely Lin Cor.							+ 64.0000	+ 60.9322*	

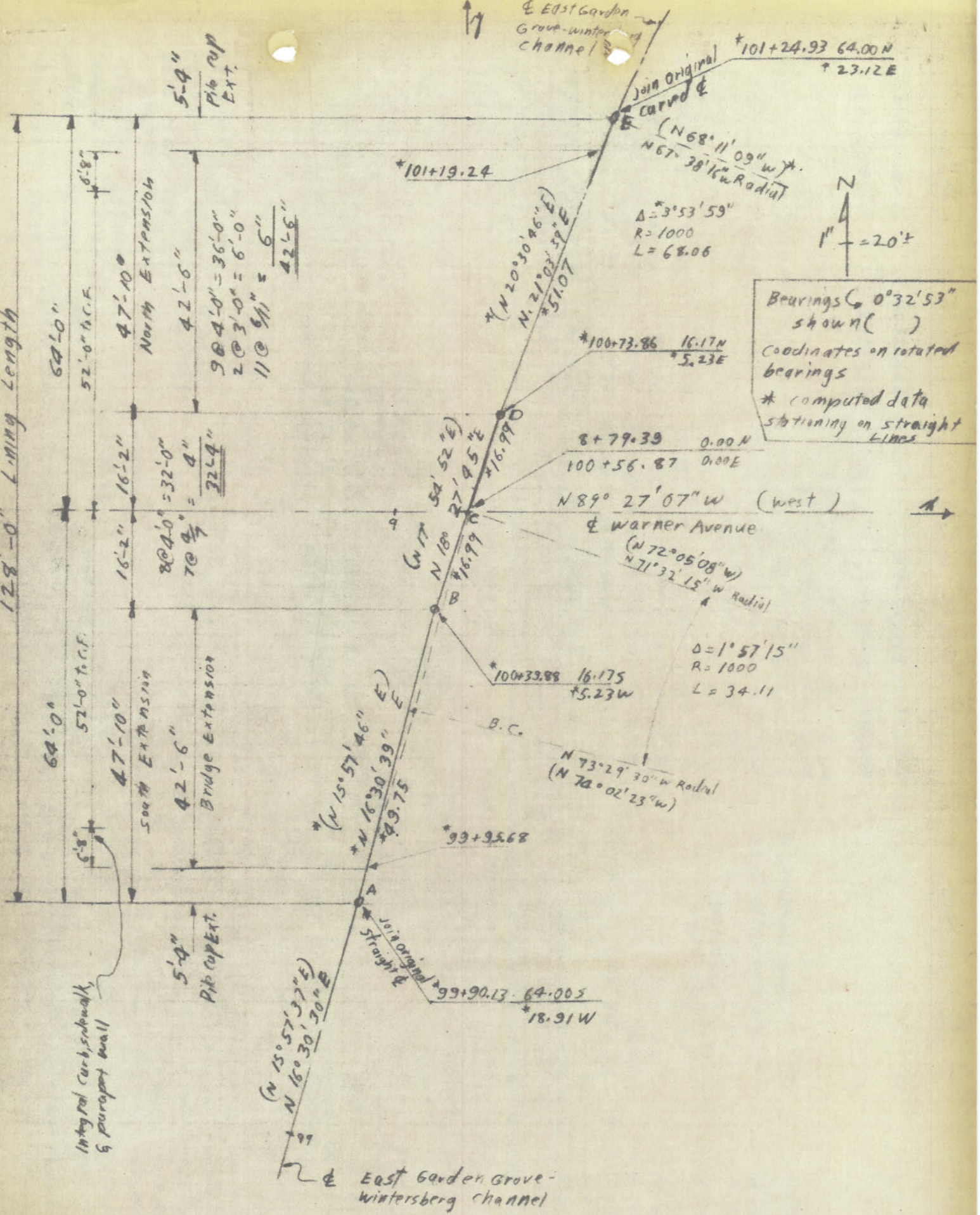
WARNER AVE BRIDGE PILE DATA

(All stationing & distances measured on skew)

END BENTS @ 69'-7½" E'ly & W'ly					INT. BENTS @ 34'-6½" E'ly & W'ly					CENTER BENT					DESCRIPTION
NO. PILES	SPACING	CHANNEL STA.	CUTOFF ELEV.	TIP ELEV.	NO. PILES	SPACING	CHANNEL STA.	CUTOFF ELEV.	TIP ELEV.	NO. PILES	SPACING	CHANNEL STA.	CUTOFF ELEV.	TIP ELEV.	SKEW ANGLE & DECK WIDTH
2	2 @ 6'-10½" = 41'-3"	101+17.17		-49	2	8 @ 5'-1⅜" = 41'-3"	101+17.17		-48	1	8 @ 5'-1⅜" = 41'-3"	101+17.17		-48	NORTH EXTENSION
2		101+10.30			2		101+12.02			1		101+12.02			20° 30' 46"
2		101+03.42			2		101+06.86			1		101+06.86			
2		100+96.55			2		101+01.70			1		101+01.70			42'-6"
2		100+89.67			2		100+96.55			1		100+96.55			[45'-4½" on skew]
2		100+82.80			2		100+91.39			1		100+91.39			
2	2 @ 2'-0⅜" = 4'-½"	100+75.92			2	2 @ 2'-0⅜" = 4'-½"	100+86.23			1	2 @ 2'-0⅜" = 4'-½"	100+86.23			
							100+81.08			1		100+81.08			
							100+75.92			1		100+75.92			
(2)	4 @ 7'-6" = 30'-0"	100+71.87	(-32)	(-49)	(2)	6 @ 5'-0" = 30'-0"	100+71.87	(-24)	(-48)	(1)	6 @ 5'-0" = 30'-0"	100+71.87	(-31)	(-48)	EXISTING BRIDGE
(2)		100+64.37			(2)		100+66.87			(1)		100+66.87			17° 52' 52"
(2)		100+56.87			(2)		100+61.87			(1)		100+61.87			
(2)		100+49.37			(2)		100+56.87			(1)		100+56.87			32'-4"
(2)	2 @ 1'-11⅜" = 3'-11⅜"	101+41.87			(2)	2 @ 1'-11⅜" = 3'-11⅜"	100+51.87			(1)	2 @ 1'-11⅜" = 3'-11⅜"	100+51.87			[33'-11⅜" on skew]
							100+46.87			(1)		100+46.87			
							100+41.87			(1)		101+41.87			
2	6 @ 6'-8" = 40'-0"	100+37.78		-49	2	8 @ 5'-0" = 40'-0"	100+37.78		-48	1	8 @ 5'-0" = 40'-0"	100+37.78		-48	SOUTH EXTENSION
2		100+31.11			2		100+32.78			1		100+32.78			15° 57' 46"
2		100+24.45			2		100+27.78			1		100+27.78			
2		100+17.78			2		100+22.78			1		100+22.78			42'-6"
2		100+11.11			2		100+17.78			1		100+17.78			[44'-2½" on skew]
2	2 @ 2'-1¼" = 4'-2½"	100+04.45			2	2 @ 2'-1¼" = 4'-2½"	100+12.78			1	2 @ 2'-1¼" = 4'-2½"	100+12.78			
							100+07.78			1		100+07.78			
							100+02.78			1		100+02.78			
2		99+97.78			2		99+97.78			1		99+97.78			

○ Construct 82 piles at the locations and to the elevations shown hereon or otherwise determined by the Engineer. The minimum bearing shall be _____ tons.

(6) of 6



WARNER AVE BRIDGE STATIONING & LAYOUT DATA (1) of 6

WARNER AVE. BRIDGE LAYOUT DATA

POINT	BEARING	DIST	COS.	SIN.	N	S	E	W	y	x
C									0.00	0.00
Rad. Pt.	(S 72°05'08"E)	1000.00	.30759651	.95156894		307.5965	951.5169		-307.5965	951.5169
	(N 74°02'23"W)	1000.00	.27497086	.96145256	274.9709			961.4526		
Tan. Pt	(S 15°57'37"W)	*32.6323				31.3744		8.9729	- 32.6256	- 9.9357
A	*(N 15°57'46"E)	*49.7517	96144036	27501350	47.8333		13.6824		- 64.00	- 18.9086
B	(N 17°54'52"E)	*16.9905	.95156894	.30759651	16.1667		5.2262		-16.1667	-5.2262
C	(S 72°05'08"E)	1000.00							0.00	0.00
Rad. Pt.	*(N68°11'09"W)	1000.00	.37159650	.92839434	371.5965			928.3943	-307.5965	+951.5169
E	*(S 20°30'46"W)	* 51.0715	.93659406	.35041626		47.8333		17.8964	+ 64.00	+ 23.1226
D									+16.1667	+ 5.2262

Project stationing vs. old stationing (channel)

Point	Project Station	Old Station	Dist. from ℄ Warner	Warner Ave. Sta.
A	99+90.13	99+90.13	64'-0" South	8+98.30
Tan. Pt. (or B.C.)	Not on Line	100+22.76	32.6256 South	8+89.33
B	100+39.88	Not on curve	16'-2" South	8+82.62
C	100+56.87	100+56.87	0'-0"	8+79.39
D	100+73.86	Not on curve	16'-2" North	8+74.16
E	101+24.93	101+24.93	64'-0" North	8+56.27

Channel section Data

All sideslopes 2/1

S = .000276 bottom slope

Bottom width 70.00' (35' each side ℄)

Roadway widths 15'

Right of way widths 196' (98' each side ℄)

Top dike elev. 10.0

F.L. @ Pt. A. -1.65
F.L. @ Pt. B -1.65
F.L. @ Pt. C -1.65
F.L. @ Pt. D -1.64
F.L. @ Pt. E -1.63

Use -1.65 throughout

Dike height = 11.65

Shelf height = 10.15

Shelf elev. = 8.50

At right angle		Skew angles 15°57'46"	17°54'52"	20°30'46"
℄ to bottom channel wall	= 35.00	36.40	36.78	To fit curve head
℄ to inside roadway	= 58.30	60.64	61.27	62.25
℄ to outside roadway	= 73.30	76.24	77.03	78.26
℄ to shelf edge	= 55.30	57.52	58.12	To fit curve ahead

Length inside span = 35'-1"

Length outside span = 34'-6½"

℄ to outside pile = 69'-7½"

℄ to edge deck units = 70'-1½"

℄ to edge pile cap = 70'-10½"

Extension Deck widths = 42'-6"		44.2045	45.3772
Station of bridge ends		99+95.68	101+19.24

COORDINATES FOR WARNER AVE BRIDGE

Point	Rotated Bearing	Dist	Cos	Sin	N or S	E or W	y	x	Warner ℄ Sta.
Extreme limits of bridge corners									
N.W. new cap cor.							+58.6667	-49.7479	9+29.14
101+19.29	East	70.875			0	+70.875	+58.6667	+21.1271	
N. E. new cap Cor.	East	70.875			0	+70.875	+58.6667	+92.0021	7+87.39
101+19.29							+58.6667	+21.1271	8+58.26
100+73.86	S 20°30'46"W	45.8772	.93699406	.35041626	-42.50	-15.9003	+16.1667	+5.2262	8+74.16
N.W. old cap cor.							+16.1667	-85.6488	9+45.04
100+73.86	East	70.875			0	+70.875	+16.1667	-5.2262	
N.E. old cap cor.	East	70.875			0	+70.875	+16.1667	+76.1012	8+03.29
S.W. old cap cor.							-16.1667	-76.1012	9+55.49
100+39.88	East	70.875			0	+70.875	-16.1667	-5.2262	
S.E. old cap cor.	East	70.875			0	+70.875	-16.667	+65.6488	8+13.74
S.W. new cap Cor.							-58.6667	-88.2580	9+67.65
99+95.68	East	70.875			0	+70.875	-58.6667	-17.3830	
S.E. new cap cor.	East	70.875			0	+70.875	-58.6667	+53.4920	8+25.90
100+39.88							-16.1667	-5.2262	8+84.62
99+95.68	S 15°57'46"W	44.2045	.96144036	.27501356	-42.50	-12.1568	-58.6667	-17.3830	8+96.77
Shelf edge lining corners									
N.W. lin Cor.							+64.0000	-36.1947	9+15.58
101+24.93	East	*59.3173			0	+59.3173	+64.0000	+23.1226	8+56.2
N.E. Lin Cor.	East	*59.8472			0	+59.8472	+64.0000	+82.9698	7+96.42
N.W. con Cor	East	58.1177			0	+58.1177	+16.1667	-52.8915	9+32.28
100+73.86	East	58.1177			0	+58.1177	+16.1667	+5.2262	
N.E. Con. Cor.							+16.16667	+63.3439	8+16.05
S.W. con Cor.					0		-16.1667	-63.3439	9+42.73
100+39.88	East	58.1177			0	+58.1177	-16.1667	-5.2262	
S.E. Con. Cor.	East	58.1177				+58.1177	-16.1667	+52.8915	8+26.50
S.W. lin Cor.							-64.0000	-76.4265	9+55.82
99+90.13	East	57.5179			0	+57.5179	-64.0000	+18.9086	8+98.30
S.E. lin. Cor.	East	57.5179			0	+57.5179	-64.0000	+38.6093	8+40.78

COORDINATES FOR WARNER AVE. BRIDGE (cont'd)

Point	Rotated Bearing	Dist	Cos.	Sin	N. or S.	E. or W.	y	x	Warner Sta.
Bottom lining corners									
N.W. Lin Cur.							+64.0000	-14.4754	8+93.87
101+24.93	East	*37.5980			0	-37.5980	+64.0000	+23.1226	
N.E. Lin Cur.	East	*37.8096			0	+37.8096	+26.8774	+60.9322	8+18.46
N.W. con. Cur.							+16.1667	-31.5572	9+10.35
100+73.86	East	36.7834			0	+36.7834	+16.1667	+5.2262	
N.E. con. Cur.	East	36.7834			0	+36.7834	+16.1667	+42.0096	8+37.38
S.W. con. Cur.							-16.1667	-42.0096	9+21.40
101+39.88	East	36.7834			0	+36.7834	-16.1667	-5.2262	
S.E. con. Cur.	East	36.7834			0	+36.7834	-16.1667	-31.5572	8+47.85
S.W. Lin Cur.							-64.0000	-55.3172	9+30.71
99+90.13	East	36.4037			0	+36.4037	-64.0000	-18.9086	
S.E. con. Cur.	East	36.4037			0	+36.4037	-64.0000	+17.5000	8+61.89
Ends of bridge back of ℄ int bents									
N.W. new int bent							+58.6667	-13.9562	8+93.35
101+19.24	East	35.0833			0	+35.0833	+58.6667	+21.1271	
N.E. new int bent	East	35.0833			0	+35.0833	+58.6667	+56.2104	8+23.18
N.W. old int. bent							+16.1667	-29.8571	9+09.25
100+73.86	East	35.0833			0	+35.0833	+16.1667	+5.2262	
N.E. old int bent.	East	35.0833			0	+35.0833	+16.1667	+40.3095	8+39.08
S.W. old int bent							-16.1667	-40.3095	9+19.70
100+39.88	East	35.0833			0	+35.0833	-16.1667	-5.2262	
S.E. old int bent	East	35.0833			0	+35.0833	-16.1667	+29.8571	8+49.53
S.W. new int bent							-58.6667	-52.4663	9+31.86
99+95.68	East	35.0833			0	+35.0833	-58.6667	-17.3830	
S.E. new int bent	East	35.0833			0	+35.0833	-58.6667	+17.7003	8+61.69

COORDINATES FOR WARNER AVE. BRIDGE

Point	Rotated Bearing	Dist.	Cos	Sin	N or S.	E or W.	Y	X	Warner ℄ Sta
N. W'ly R/W Cor.	*S 70°26'25"E	1098.00	.33478734	.94229371	-367.5965	+1034.6385	+ 60.0000	- 83.1216*	9+62.51
Rad. Pt.	N 65°57'00"W	902.00	.40753492	.91318963	+367.5965	- 823.6970	- 307.5965	+ 951.5163	
Fut N'Ely R/W Cor.							+ 60.0000	+127.8199*	7+51.57
Ex. N Ely R/W Cor.	*N 68°01'14"W	902.00	.37427550	.92731756	+337.5965	- 836.4407	+ 30.0000	+115.0765*	7+64.31
Fut. S.W'ly R/W Cor.	S 74°02'23"E	98.00	.27497086	.96145256	- 26.9471	+94.2224	- 60.0000	-119.6338*	9+93.08
Pt. on ℄ R/W	N 15°57'37"E	*23.8671			+ 22.9471	+ 6.5628	- 86.9471	- 25.4714	
99+90.13	N 15°57'37"E	* 32.1879			+ 30.9471	+ 8.8507	- 64.0000	- 18.9086	
Pt. on ℄ R/W	S 74°02'23"E	98.0000			- 26.9471	+94.2224	-33.0529	-10.0579	
Fut. S.E.'ly R/W Cor.							-60.0000	+ 84.1645 *	7+95.2
Ex. S.W.'ly R/W Cor.	S 74°02'23"E	98.00			- 26.9471	+94.2224	- 30.0000	- 111.4394 *	9+90.50
Pt. on ℄ R/W.	S 15°57'37"W	* 7.3357			- 7.0529	- 2.0171	-56.9471	-16.8915	
99+90.13	N 15°57'37"E	* 63.3906			+ 60.9471	+ 17.4306	-64.0000	-18.9086	
Pt. on ℄ R/W	S 74°02'23"E	98.00			- 26.9471	+94.2224	- 3.0529	- 1.4780	
Ex. S.E.'ly R/W Cor.							-31.0000	+92.7444 *	7+86.65
N'wly Lin. shift Cor.	*S 63°22'58"E	1055.30	.35212404	.92575335	-371.5965	+987.7116	+64.0000	- 36.1947*	
Rad. Pt.	*N 66°50'13"W	944.70	.39334868	.91938937	+371.5965	-868.5471	- 307.5965	+ 951.5163	
N Ely Lin shift Cor.							+64.0000	+ 82.9698*	
N'wly bat. Lin Cor	*S 58°57'34"E	1035.00	.35903043	.93332589	-371.5965	+965.9927	+ 64.0000	- 14.4754*	
Rad. Pt.	*N 67°21'06"W	965.00	.38507403	.92288566	+371.5965	-890.5847	- 307.5965	+ 951.5163	
N Ely Lin Cor.							+ 64.0000	+ 60.9322*	

Alt. Lin. Corners to fit Curve

WARNER AVE BRIDGE PILE DATA

(All stationing & distances measured on skew)

END BENTS @ 69'-7½" E'ly & W'ly					INT. BENTS @ 34'-6½" E'ly & W'ly					CENTER BENT					DESCRIPTION
NO. PILES	SPACING	CHANNEL STA.	CUTOFF ELEV.	TIP ELEV.	NO. PILES	SPACING	CHANNEL STA.	CUTOFF ELEV.	TIP ELEV.	NO. PILES	SPACING	CHANNEL STA.	CUTOFF ELEV.	TIP ELEV.	SKEW ANGLE & DECK WIDTH
2	2 @ 2'-0 3/4" = 4'-1 1/2"	101+17.17		-49	2	8 @ 5'-1 3/8" = 41'-3"	101+17.17		-48	1	8 @ 5'-1 3/8" = 41'-3"	101+17.17		-48	NORTH EXTENSION
2		101+10.30			2		101+12.02			1		101+06.86			20° 30' 46"
2		101+03.42			2		101+01.70			1		101+01.70			
2		100+96.55			2		100+96.55			1		100+96.55			42'-6"
2		100+89.67			2		100+91.39			1		100+91.39			[45'-4½" on skew
2		100+82.80			2		100+86.23			1		100+86.23			
2		100+75.92			2		100+81.08			1		100+81.08			
							100+75.92			1		100+75.92			
(2)	4 @ 7'-0" = 28'-0" 2 @ 2'-0 3/4" = 4'-1 1/2"	100+71.87	(20.8)	(-49)	(2)	6 @ 5'-0" = 30'-0" 2 @ 1'-11 3/8" = 3'-11 3/4"	100+71.87	(8.24)	(-48)	(1)	6 @ 5'-0" = 30'-0" 2 @ 1'-11 3/8" = 3'-11 3/4"	100+71.87	(15.1)	(-48)	EXISTING BRIDGE
(2)		100+64.37			(2)		100+66.87			(1)		100+66.87			17° 54' 52"
(2)		100+56.87			(2)		100+61.87			(1)		100+61.87			
(2)		100+49.37			(2)		100+56.87			(1)		100+56.87			32'-4"
(2)		101+41.87			(2)		100+51.87			(1)		100+51.87			[33'-11 3/4" on skew
					(2)		100+46.87			(1)		100+46.87			
					(2)		100+41.87			(1)		101+41.87			
2	8 @ 5'-0" = 40'-0" 2 @ 2'-1 1/4" = 4'-2 1/2"	100+37.78		-49	2	8 @ 5'-0" = 40'-0" 2 @ 2'-1 1/4" = 4'-2 1/2"	100+37.78		-48	1	8 @ 5'-0" = 40'-0" 2 @ 2'-1 1/4" = 4'-2 1/2"	100+37.78		-48	SOUTH EXTENSION
2		100+31.11			2		100+32.78			1		100+32.78			15° 57' 46"
2		100+24.45			2		100+27.78					100+27.78			
2		100+17.78			2		100+22.78			1		100+22.78			42'-6"
2		100+11.11			2		100+17.78			1		100+17.78			[44'2½" on skew
2		100+04.45			2		100+12.78			1		100+12.78			
2		99+97.78			2		100+07.78			1		100+07.78			
					2		100+02.78			1		100+02.78			
					2		99+97.78			1		99+97.78			

Construct 82 piles at the locations and to the elevations shown hereon or otherwise determined by the Engineer. The minimum bearing shall be _____ tons.

(6) of 6