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# Bridge Inspection Records Information System

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State of California  
Department of Transportation

**Division of Maintenance  
Structures Maintenance & Investigations**



**DEPARTMENT OF TRANSPORTATION**  
Structure Maintenance & Investigations

Bridge Number : 55C0038  
Facility Carried: SANTIAGO CYN RD  
Location : 0.2 MI W/O SILVERADO CYN  
City :  
Inspection Date : 05-JUN-01

**Bridge Inspection Report**

**Inspection Type**

Routine ☒ Group A ☐ Underwater ☐ Special ☐ Other ☐

**Name : SANTIAGO CREEK**

**CONSTRUCTION INFORMATION**

Year Built : 1963 Skew (degrees): 0  
Year Widened : N/A No. of Joints : 0  
Length (m) : 69.5 No. of Hinges : 0

Description of Structure : Continuous four span CIP/RC T-beam (5 each) with RC single column bents and RC open end seat abutments, all supported upon spread footings.

Span Configuration : (W) 14.9 m, 2 @ 19.2 m, 14.9 m (E) c/c

**LOAD CAPACITY AND RATINGS**

Design Live Load : MS - 18 OR HS - 20  
Inventory Rating : 40.8 metric tons Calculation Method : LOAD FACTOR  
Operating Rating : 68.9 metric tons Calculation Method : LOAD FACTOR  
Permit Rating : PPPPP  
Posting Load : Type 3 N/A english tons Type 3S2 N/A english tons Type 3-3 N/A english tons

**DESCRIPTION ON STRUCTURE**

Bridge width : (S) 0.1 m br, 2 @ 4.6 m, 0.1 m br (N)  
Total Width : 9.3 m Net Width : 9.10 m No. of Lanes : 2  
Rail Description : Metal Beam Rail Code : 0000  
Min. Vertical Clearance : Unimpaired

**DESCRIPTION UNDER STRUCTURE**

Channel Description : Natural earth trapezoidal with a cobbled bottom.

**WORK DONE**

**CONDITION OF STRUCTURE**

Unsealed cracks exist in the concrete deck which are of moderate size and density. (0)

The top of footing at Bent #3 is exposed.

Otherwise, the structure is in good condition.

**SCOUR**

Additional rip rap has been placed at Bent 3. The rip rap has been grouted. The Scour SMART flag 361 is being eliminated. The structure is scheduled to be retrofitted seismically in 2003. The footings are scheduled to be taken to bedrock.

| ELEMENT LEVEL INSPECTION RATINGS |      |                                          |     |             |                             |       |       |       |       |
|----------------------------------|------|------------------------------------------|-----|-------------|-----------------------------|-------|-------|-------|-------|
| F#                               | Elem | Element Description                      | Env | Total Units | Qty in each Condition State |       |       |       |       |
|                                  | No.  |                                          |     | Quantity    | St. 1                       | St. 2 | St. 3 | St. 4 | St. 5 |
| 01 12                            |      | Concrete Deck - Bare                     | 2   | 620 sq.m.   | 620                         | 0     | 0     | 0     | 0     |
| 01 110                           |      | Reinforced Conc Open Girder/Beam         | 2   | 348 m.      | 348                         | 0     | 0     | 0     | 0     |
| 01 205                           |      | Reinforced Conc Column or Pile Extension | 2   | 3 ea.       | 3                           | 0     | 0     | 0     | 0     |
| 01 215                           |      | Reinforced Conc Abutment                 | 2   | 20 m.       | 20                          | 0     | 0     | 0     | 0     |
| 01 337                           |      | Metal Railing (W6X25 Posts)              | 2   | 150 m.      | 150                         | 0     | 0     | 0     | 0     |
| 01 358                           |      | Deck Cracking                            | 2   | 1 ea.       | 0                           | 0     | 1     | 0     | 0     |

Bridge No.: 55C0038 Location: 0.2 MI W/O SILVERADO CYN Inspection Date: 05-JUN-01

WORK RECOMMENDATIONS - NONE

Inspected By : M. Ogata

*M. Ogata*  
\_\_\_\_\_  
Registered Civil Engineer



CC : TMRut  
Orange County

Bridge No.: 55C0038 Location: 0.2 MI W/O SILVERADO CYN Inspection Date: 05-JUN-01

## STRUCTURE INVENTORY AND APPRAISAL REPORT

## \*\*\*\*\* IDENTIFICATION \*\*\*\*\*

(1) STATE NAME - CALIFORNIA 069  
 (8) STRUCTURE NUMBER 55C0038  
 (5) INVENTORY ROUTE(ON/UNDER) - ON 1 40 0L030N  
 (2) HIGHWAY AGENCY DISTRICT 12  
 (3) COUNTY CODE 059 (4) PLACE CODE 00000  
 (6) FEATURE INTERSECTED - SANTIAGO CREEK  
 (7) FACILITY CARRIED - SANTIAGO CYN RD  
 (9) LOCATION - 0.2 MI W/O SILVERADO CYN  
 (11) MILEPOINT/KILOMETERPOINT 0  
 (12) BASE HIGHWAY NETWORK - NOT ON NET 0  
 (13) LRS INVENTORY ROUTE & SUBROUTE  
 (16) LATITUDE 33 DEG 44 MIN 52 SEC  
 (17) LONGITUDE 117 DEG 40 MIN 33 SEC  
 (98) BORDER BRIDGE STATE CODE % SHARE %  
 (99) BORDER BRIDGE STRUCTURE NUMBER

## \*\*\*\*\* STRUCTURE TYPE AND MATERIAL \*\*\*\*\*

(43) STRUCTURE TYPE MAIN: MATERIAL - CONCRETE CONT  
 TYPE - TEE BEAM CODE 2 04  
 (44) STRUCTURE TYPE APPR: MATERIAL -  
 TYPE - CODE  
 (45) NUMBER OF SPANS IN MAIN UNIT 4  
 (46) NUMBER OF APPROACH SPANS 0  
 (107) DECK STRUCTURE TYPE CIP CONCRETE CODE 1  
 (108) WEARING SURFACE / PROTECTIVE SYSTEM:  
 A) TYPE OF WEARING SURFACE - CONCRETE CODE 1  
 B) TYPE OF MEMBRANE - NONE CODE 0  
 C) TYPE OF DECK PROTECTION - NONE CODE 0

## \*\*\*\*\* AGE AND SERVICE \*\*\*\*\*

(27) YEAR BUILT 1963  
 (106) YEAR RECONSTRUCTED 0000  
 (42) TYPE OF SERVICE: ON - HIGHWAY 1  
 UNDER - WATERWAY 5  
 (28) LANES: ON STRUCTURE 02 UNDER STRUCTURE  
 (29) AVERAGE DAILY TRAFFIC 9000  
 (30) YEAR OF ADT 1999 (109) TRUCK ADT 5%  
 (19) BYPASS, DETOUR LENGTH 40 KM

## \*\*\*\*\* GEOMETRIC DATA \*\*\*\*\*

(48) LENGTH OF MAXIMUM SPAN 19.2 M  
 (49) STRUCTURE LENGTH 69.5 M  
 (50) CURB OR SIDEWALK: LEFT 0 M RIGHT 0 M  
 (51) BRIDGE ROADWAY WIDTH CURB TO CURB 9.1 M  
 (52) DECK WIDTH OUT TO OUT 9.3 M  
 (32) APPROACH ROADWAY WIDTH (W/SHOULDERS) 12.2 M  
 (33) BRIDGE MEDIAN - CLOSED (NO BARRIER) 2  
 (34) SKEW 0 DEG (35) STRUCTURE FLARED NO  
 (10) INVENTORY ROUTE MIN VERT CLEAR 99.99 M  
 (47) INVENTORY ROUTE TOTAL HORIZ CLEAR 9.1 M  
 (53) MIN VERT CLEAR OVER BRIDGE RDWY 99.99 M  
 (54) MIN VERT UNDERCLEAR REF - NOT H/RR 0 M  
 (55) MIN LAT UNDERCLEAR RT REF - NOT H/RR 0 M  
 (56) MIN LAT UNDERCLEAR LT 0 M

## \*\*\*\*\* NAVIGATION DATA \*\*\*\*\*

(38) NAVIGATION CONTROL - NOT APPLICABLE CODE N  
 (111) PIER PROTECTION - NOT REQUIRED CODE 1  
 (39) NAVIGATION VERTICAL CLEARANCE 0 M  
 (116) VERT-LIFT BRIDGE NAV MIN VERT CLEAR 0 M  
 (40) NAVIGATION HORIZONTAL CLEARANCE 0

## \*\*\*\*\* SUPPLIENCY RATING = 64.0 \*\*\*\*\*

STATUS =

HEALTH INDEX = 100

## \*\*\*\*\* CLASSIFICATION \*\*\*\*\* CODE

(112) NBIS BRIDGE LENGTH - YES Y  
 (104) HIGHWAY SYSTEM - NOT ON NHS 0  
 (26) FUNCTIONAL CLASS - MINOR ARTERIAL URBAN 16  
 (100) DEFENSE HIGHWAY - NOT STRAHNET 0  
 (101) PARALLEL STRUCTURE - NONE EXISTS N  
 (102) DIRECTION OF TRAFFIC - 2 WAY 2  
 (103) TEMPORARY STRUCTURE -  
 (105) FEDERAL LANDS HIGHWAY - NOT APPLICABLE 0  
 (110) DESIGNATED NATIONAL NETWORK - NOT ON NET 0  
 (20) TOLL - ON FREE ROAD 3  
 (21) MAINTAIN - COUNTY HIGHWAY AGENCY 2  
 (22) OWNER - COUNTY HIGHWAY AGENCY 2  
 (37) HISTORICAL SIGNIFICANCE - NOT ELIGIBLE 5

## \*\*\*\*\* CONDITION \*\*\*\*\* CODE

(58) DECK 5  
 (59) SUPERSTRUCTURE 7  
 (60) SUBSTRUCTURE 7  
 (61) CHANNEL & CHANNEL PROTECTION 4  
 (62) CULVERTS N

## \*\*\*\*\* LOAD RATING AND POSTING \*\*\*\*\* CODE

(31) DESIGN LOAD - MS - 18 OR HS - 20 5  
 (63) OPERATING RATING METHOD - LOAD FACTOR 1  
 (64) OPERATING RATING - 68.9  
 (65) INVENTORY RATING METHOD - LOAD FACTOR 1  
 (66) INVENTORY RATING - 40.8  
 (70) BRIDGE POSTING - Equal to or above legal loads 5  
 (41) STRUCTURE OPEN, POSTED OR CLOSED - A  
 DESCRIPTION - OPEN, NO RESTRICTION

## \*\*\*\*\* APPRAISAL \*\*\*\*\* CODE

(67) STRUCTURAL EVALUATION 7  
 (68) DECK GEOMETRY 4  
 (69) UNDERCLEARANCES, VERTICAL & HORIZONTAL N  
 (71) WATER ADEQUACY 9  
 (72) APPROACH ROADWAY ALIGNMENT 8  
 (36) TRAFFIC SAFETY FEATURES 0000  
 (113) SCOUR CRITICAL BRIDGES 2

## \*\*\*\*\* PROPOSED IMPROVEMENTS \*\*\*\*\*

(75) TYPE OF WORK - DECK REHABILITATION CODE 36  
 (76) LENGTH OF STRUCTURE IMPROVEMENT 69.5 M  
 (94) BRIDGE IMPROVEMENT COST \$323,000  
 (95) ROADWAY IMPROVEMENT COST \$32,000  
 (96) TOTAL PROJECT COST \$485,000  
 (97) YEAR OF IMPROVEMENT COST ESTIMATE 1999  
 (114) FUTURE ADT 18000  
 (115) YEAR OF FUTURE ADT 2019

## \*\*\*\*\* INSPECTIONS \*\*\*\*\*

(90) INSPECTION DATE 06/01 (91) FREQUENCY 24 MO  
 (92) CRITICAL FEATURE INSPECTION: (93) CFI DATE  
 A) FRACTURE CRIT DETAIL - NO -1 MO A)  
 B) UNDERWATER INSP - NO -1 MO B)  
 C) OTHER SPECIAL INSP - NO -1 MO C)

SUPPLEMENTARY BRIDGE REPORT

Bridge No. 55C0038

Location 12-Ora-L030-CR

Date of Office Report 5/14/96 PER

Name Santiago Creek

Ratings:

Deck Superstructure 3 Substructure Waterway Aq  
Channel & Channel Prot Culvert Approach Rway Align

CONVERSATION  
WITH  
SHYH T. LEE  
ON  
3/16/99

TYPE OF INVESTIGATION/REPORT

Biennial Category A Other  
Damage Underwater Office X

This report addresses hydraulic and scour issues only

Description

The streambed has been degraded due to scour and aggregate mining operation. Single column piers are on spread footings and the pier #3 footing has been exposed.

Item 60

The condition rating for Item 60, Substructure, is changed to 3 to conform with Item 113.

Item 113

The structure scour potential has been calculated in accordance with FHWA Technical Advisory T5140.23, "Evaluating Scour at Bridges". The structure foundations were determined to be unstable for the calculated scour conditions. Item 113, "Vulnerability to scour", has been changed to 3.

Item 61

The condition rating for Item 61, Channel and Channel Protection, is changed to 3 to reflect channel damage.

Work Recommended

It is recommended the the bridge be replaced with a single span RC box girder bridge. The streambed should be lined with 1 ton riprap from 20 ft upstream of the structure to 20 ft downstream of the structure. Construct a rock checkdam downstream of the structure. The work is to be placed in the SRTAIN program in the 1988 fiscal year with an urgency factor of 1. The cost is estimated at \$350,000.

Shyh Lee  
Registered Civil Engineer



SUPPLEMENTARY BRIDGE REPORT

Bridge No 55C0038  
Location 12-Ora-L030-CR  
Date of Office Report 5/14/96 — PER  
Name Santiago Creek CONVERSATION  
Ratings WITH  
Deck \_\_\_\_\_ Superstructure 3 Substructure \_\_\_\_\_ Waterway Aq \_\_\_\_\_ SHYH T LEE  
Channel & Channel Prot \_\_\_\_\_ Culvert \_\_\_\_\_ Approach Rway Align \_\_\_\_\_ ON  
3/16/99

TYPE OF INVESTIGATION/REPORT

Biennial \_\_\_\_\_ Category A \_\_\_\_\_ Other \_\_\_\_\_  
Damage \_\_\_\_\_ Underwater \_\_\_\_\_ Office X

This report addresses hydraulic and scour issues only

Description

The streambed has been degraded due to scour and aggregate mining operation. Single column piers are on spread footings and the pier #3 footing has been exposed.

Item 60

The condition rating for Item 60, Substructure, is changed to 3 to conform with Item 113.

Item 113

The structure scour potential has been calculated in accordance with FHWA Technical Advisory T5140 23, "Evaluating Scour at Bridges". The structure foundations were determined to be unstable for the calculated scour conditions. Item 113, "Vulnerability to scour", has been changed to 3.

Item 61

The condition rating for Item 61, Channel and Channel Protection, is changed to 3 to reflect channel damage.

Work Recommended

It is recommended the bridge be replaced with a single span RC box girder bridge. The streambed should be lined with 1 ton riprap from 20 ft upstream of the structure to 20 ft downstream of the structure. Construct a rock checkdam downstream of the structure. The work is to be placed in the SRTAIN program in the 1988 fiscal year with an urgency factor of 1. The cost is estimated at \$350,000.

Shyh Lee  
Registered Civil Engineer



## Item 113 - Scour Critical Bridges

1 digit

Use a single-digit code as indicated below to identify the current status of the bridge regarding its vulnerability to scour. Scour analyses shall be made by hydraulic/geotechnical/structural engineers. Details on conducting a scour analysis are included in the FHWA Technical Advisory 5140.23 titled, "Evaluating Scour at Bridges." Whenever a rating factor of 4 or below is determined for this item, the rating factor for Item 60 - Substructure may need to be revised to reflect the severity of actual scour and resultant damage to the bridge. A scour critical bridge is one with abutment or pier foundations which are rated as unstable due to (1) observed scour at the bridge site or (2) a scour potential as determined from a scour evaluation study.

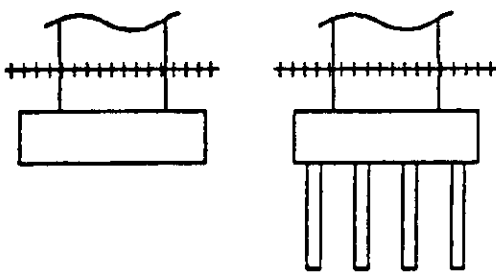
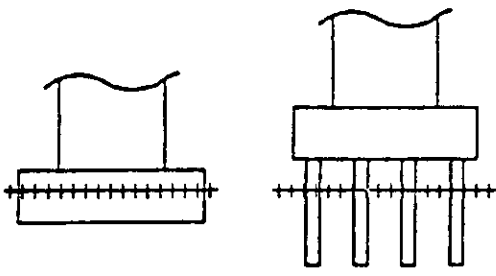
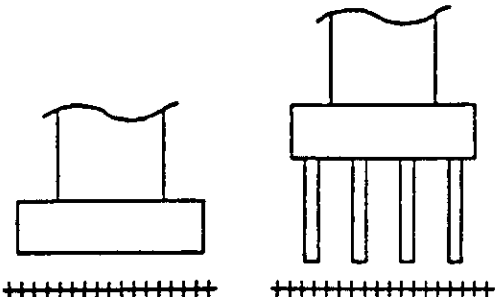
| <u>Code</u> | <u>Description</u>                                                                                                                                                                                                                                         |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| N           | Bridge not over waterway                                                                                                                                                                                                                                   |
| U           | Bridge with "unknown" foundation that has not been evaluated for scour. Since risk cannot be determined, flag for monitoring during flood events and, if appropriate, closure.                                                                             |
| T           | Bridge over "tidal" waters that has not been evaluated for scour, but considered low risk. Bridge will be monitored with regular inspection cycle and with appropriate underwater inspections ("Unknown" foundations in "tidal" waters should be coded U.) |
| 9           | Bridge foundations (including piles) on dry land well above flood water elevations.                                                                                                                                                                        |
| 8           | Bridge foundations determined to be stable for assessed or calculated scour conditions, calculated scour is above top of footing. (Example A)                                                                                                              |
| 7           | Countermeasures have been installed to correct a previously existing problem with scour. Bridge is no longer scour critical.                                                                                                                               |
| 6           | Scour calculation/evaluation has not been made. ( <u>Use only to describe case where bridge has not yet been evaluated for scour potential</u> )                                                                                                           |
| 5           | Bridge foundations determined to be stable for calculated scour conditions, scour within limits of footing or piles. (Example B)                                                                                                                           |
| 4           | Bridge foundations determined to be stable for calculated scour conditions, field review indicates action is required to protect exposed foundations from effects of additional erosion and corrosion.                                                     |
| 3           | Bridge is scour critical, bridge foundations determined to be unstable for calculated scour conditions.<br>- Scour within limits of footing or piles. (Example B)<br>- Scour below spread-footing base or pile tips. (Example C)                           |

(codes continued on the next page)

# Item 113 - Scour Critical Bridges (cont'd)

| <u>Code</u> | <u>Description</u>                                                                                                                                                     |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2           | Bridge is scour critical, field review indicates that extensive scour has occurred at bridge foundations Immediate action is required to provide scour countermeasures |
| 1           | Bridge is scour critical, field review indicates that failure of piers/abutments is imminent Bridge is closed to traffic                                               |
| 0           | Bridge is scour critical Bridge has failed and is closed to traffic                                                                                                    |

## EXAMPLES.

|   |                                        | <u>CALCULATED SCOUR DEPTH</u>                                                        | <u>ACTION NEEDED</u>                                          |
|---|----------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------|
| A | Above top of footing                   |    | None - indicate rating of 8 for this item                     |
| B | Within limits of footing or piles      |  | Conduct foundation structural analysis                        |
| C | Below pile tips or spread-footing base |  | Provide for monitoring and scour countermeasures as necessary |
|   |                                        | <p>SPREAD FOOTING<br/>(NOT FOUNDED<br/>IN ROCK)</p> <p>PILE FOOTING</p>              |                                                               |

+++++ = Calculated scour depth



Bridge Number 55C-38

**TYPE OF INVESTIGATION/REPORT**

|            |          |        |          |
|------------|----------|--------|----------|
| BIENNIAL   | <u>X</u> | DAMAGE | ___      |
| CATEGORY A | ___      | OTHER  | <u>X</u> |
| UNDERWATER | ___      | OFFICE | ___      |

Location 12 - Ora - FAS L030-CR  
Dist.-Co.-Rte.-City

Date of Investigation May 16, 1995

Name SANTIAGO CREEK (Santiago Canyon Road, 0.2 mile west of Silverado Canyon Road)

**CONDITION RATINGS:**

Condition ratings of all bridge elements are shown on the PONTIS DATA FORM (Attachment A).

Channel & Channel Protection

4 ,

**DISCUSSION:**

An investigation of bridge No. 55C-38 was conducted upon request of Sinclair Wang, Preliminary Investigation Senior. Structure Maintenance was alerted to the fact that bent #3 of said bridge had scoured badly to the extent that it might have to be shut down.

Greg P. Balinhasay was informed of the situation at 0830 hours and headed out to the site at 0900 hours. An investigation was conducted as soon as I got to the job site, at 1000 hours, and the following is the report of the investigation.

**SCOUR CRITICAL:**

A scour rating of C-2 is appropriate. Embankment around bent #3 column has completely washed away, exposing the pedestal, measured at 1.83 m x 1.83 m x 0.5 m, completely. The top of bent #3 footing is also exposed. The footing perimeter is protected from further scour with cobbles and boulders cemented in place with cement and sand slurry.

**CONDITION OF STRUCTURE:**

A. Moderate random deck cracking was observed. Light cracks could also be seen on girders especially near the abutment. Spall on north exterior girder of span #3 was also observed. No rebar is exposed.

B. Bent #2 footing is amply protected with riprap.

Overall condition of structure is good.

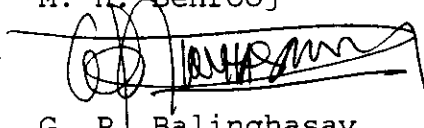
**WORK RECOMMENDED:**

1. Build riprap around bent #3 column.

2. Investigate the design flow and calculate scour depth using hydraulic analysis specified in Federal Publication HEC 18 or similar analysis method.

ENCROACHMENT:

See summary of encroachments sheet for this report.

M. H. Behrooj *mh*  
By   
G. P. Balinghasay

GPB:cd  
cc: CDHarris  
Orange County  
WLindsey  
SWang



INFORMATION ONLY - NOT FOR UPDATE

|                           |    |
|---------------------------|----|
| SCOUR CRITICAL            | NO |
| CATEGORY A                | NO |
| FRACTURE CRITICAL         | NO |
| ELIGIBLE FOR RAIL UPGRADE | NO |
| UNDERWATER INSPECTION     | NO |

|          |     |
|----------|-----|
| DISTRICT | 12  |
| COUNTY   | ORA |
| ROUTE    |     |
| POSTMILE |     |
| NAME     |     |

05/30/95

BY:

Bridge No. 55C-38

Name SANTIAGO CREEK (Santiago Cyn. Rd., 0.2 mile W. of Silverado Cyn. Rd.) Location 12-Ora-FAS L030-CR  
Dist-Co.-Rte.-P.M.

## SUMMARY OF ENCROACHMENTS

| Permit No.<br>and Permittee | Date    | Description & Location on Bridge                                                                                                                       |
|-----------------------------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
|                             | 5-16-95 | 1 - 0.1 m steel pipe attached to outside of north exterior girder.<br><br>1 - 0.3 m cement coated pipe attached to underside of south exterior girder. |

HBD M 30

**SUPPLEMENTARY BRIDGE REPORT**

DS-M19 (REV. 12/91)

Bridge Number 55C-38

Location 12 - Ora- FAS L030-CR  
Dist.-Co.-Rte.-City

Date of Investigation June 12, 1992

**TYPE OF INVESTIGATION/REPORT**

BIENNIAL X DAMAGE       
CATEGORY A      OTHER       
UNDERWATER      OFFICE     

Name SANTIAGO CREEK (Santiago Canyon Road, 0.2 mile west of  
Silverado Canyon Road)

**CONDITION RATINGS:**

| Deck | Superstructure | Substructure | Channel & Channel Protection | Culvert |
|------|----------------|--------------|------------------------------|---------|
| (6)  | 8              | 8            | (8)                          | N       |

**CONDITION OF STRUCTURE:**

An estimated 40% of concrete bridge deck area contains moderate random and block cracking, at present there is no delamination of the concrete deck surface.

Condition of the structure is satisfactory.

**REVISIONS:**

Name: SANTIAGO CREEK (Santiago Canyon Road, 0.2 mile west of  
Silverado Canyon Road)

Condition Rating: Deck - 6  
Channel & Channel Protection - 8

(There is no deterioration in condition of channel banks from the previous report, the above rating change indicates the nature of the earth channel slopes to reflect more closely to the current Federal Coding Guide.)

Henry Ma

HM:cd  
cc: INagai (2)  
County of Orange



BRIDGE REPORT

DS-M58 (REV. 4/90)

14W14

Bridge No. 55C - 38

Location 12 - Ora - FAS L030-CR  
Dist Co Rte City

REVISED ORIGINAL REPORT

Date of Investigation May 25, 1990

Name SANTIAGO CREEK (Santiago Canyon Road, 1.1 miles E. of Route 55)

Lat. 33° - 44.8'N Long. 117° - 40.5'W

Custodian County of Orange Owner County of Orange

STRUCTURAL DATA AND HISTORY

Year Built 1963 By Orange County Contract No. 63-7Y24C3-P

Designed by: Orange County Plans Avail. @ DOS

Description: 4 span continuous CIP RC "T" beam (5 each) supported by single column piers and open end RC seated abutments, all on spread footings.

Spans (W) 49'; 2 @ 63'; 49' (E)

Length 228' NBIS Bridge Length Yes Skew None

Number Of Intermediate Joints: @Hinges N @Bents N

Maximum Column/Pier Height: (Less than 20') X (20'-29') (30' & Over)

Design Live Load H20-S16-44 Design Method Unknown

DESCRIPTION - ON STRUCTURE

Bridge Width (S) 0.3'br; 30'; 0.3'br (N)

Total Width 30.5' Net Width 30' Lanes 2 Tracks None

Median None Rail Type Metal Beam

0000

Vert. Clearance over deck Unimpaired Appr. Rdwy. Width 40'

Deck Type 1 Wearing Surface/Prot. Sys. 100 Concrete/None

Alignment R = 1200'

DESCRIPTION - UNDER STRUCTURE

Roadway Section None

Clearances: Road: Vert. Horiz. Lt. ; Rt.

Lanes Tracks

Facilities Crossed Santiago Creek (E08)

May 25, 1990

## DESCRIPTION - HYDRAULICS

Channel Natural channel, moderately vegetated

Navigable: Yes ☐ No ☒ Clearances: Vert.

Horiz.

Pier/Abutment Protection (For Navigation) ☐

## TRAFFIC INFORMATION

|                                     | DECK            | YEAR                           | UNDER | YEAR |
|-------------------------------------|-----------------|--------------------------------|-------|------|
| Average Daily Traffic & Year :      | 14,000          | 1989                           | N     |      |
| Average Daily Traffic (Future) :    | 15,000 Est      | 2010                           | N     |      |
| Average Daily Trucks ( % OF ADT ) : | 5% Est          |                                | N     |      |
| Bypass Detour Length                | 25 miles        |                                | N     |      |
| Shell Route:                        | No              |                                | N     |      |
| Functional Classification :         | 07              |                                | N     |      |
| LOAD RATINGS:                       | Inventory HS 25 | Operating HS 42                |       |      |
|                                     | Permit PPPPP    | Computation Method Load Factor |       |      |

## CONDITION RATINGS:

|                              |   |                |   |              |     |
|------------------------------|---|----------------|---|--------------|-----|
| Deck                         | 7 | Superstructure | 8 | Substructure | 8   |
| Channel & Channel Protection | 9 | Culvert        | N | Widenable    | Yes |

## APPRAISAL RATINGS:

|                   |   |                            |   |
|-------------------|---|----------------------------|---|
| Waterway Adequacy | 9 | Approach Roadway Alignment | 8 |
|-------------------|---|----------------------------|---|

Date of Revisions

CONDITION OF STRUCTURE:

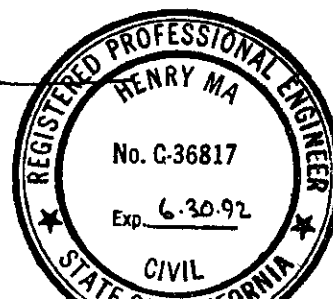
There is extensive transverse and block cracking, up to 1/8" wide, throughout the concrete bridge deck.

Condition of the structure is good.

ENCROACHMENT:

4" steel pipe attached to outside of north exterior girder.  
12" cement coated pipe attached to underside of south exterior girder.

Henry Ma



HM:ms

cc: INagai (2)

County of Orange

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
SUPPLEMENTARY BRIDGE REPORT  
DS-M19 (REV. 2/75)

Bridge No. 55C-38

Location 7-Ora-FAS L030-CR  
Dist - Co - Rte - PM - City

Date of Investigation May 9, 1988

Name SANTIAGO CREEK (Santiago Canyon Rd., 11 miles E. of Rte. 55)

CONDITION RATING:

APPRAISAL RATING:

Deck 6 Superstructure 8 Substr. & Pipes 8 Overall 6  
Channel & Channel Protection 6 Retaining Walls N

Widenable? Yes ☒ No ☐ Conditional ☐

Action Required by COUNTY Yes ☐ No ☒

REVISION:

Condition Rating: Deck - 6  
Appraisal Rating: Overall - 6  
Average Daily Traffic: 11,000 (1987)

CONDITION OF STRUCTURE:

There is moderate transverse deck cracking (up to 1/16" wide) and block cracking over approximately 20% of deck area.

Condition of the structure is fair.

RECOMMENDED POSTING:

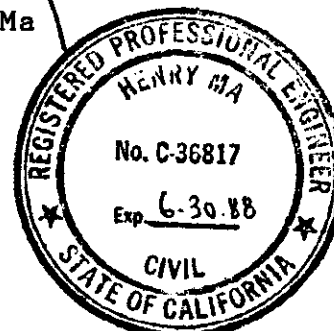
None

WORK RECOMMENDED:

None

HM/pht  
cc: INagai (2)  
Orange County (2)

Henry Ma





STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
SUPPLEMENTARY BRIDGE REPORT  
DN-OS M19 (REV. 1/74)

55C-38

Bridge No. 7-Ora-FAS L030-CR  
Location Dist - Co - Hwy - Rd - City  
Date of Investigation June 17, 1986

Name SANTIAGO CREEK (Santiago Canyon Rd. 11 miles E. of Rte.55)

CONDITION RATING:

APPRAISAL RATING:

Deck 7 Superstructure 8 Substr. & Pipes 8 Overall 7  
Channel & Channel Protection 6 Retaining Walls N

Widenable? Yes ☒ No ☐ Conditional ☐

Action Required by County Yes ☐ No ☒

PRIORITY

A - Immediate Action  
B - Early Scheduling  
C - Routine Maint.  
O - For Record Only

CONDITION OF STRUCTURE:

There is moderate transverse deck cracking and some block cracking. 0

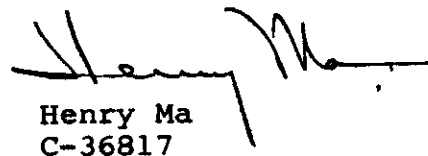
Otherwise, the overall condition of the structure is good.

RECOMMENDED POSTING:

None

WORK RECOMMENDED:

None

  
Henry Ma  
C-36817

HM:pht

cc: INagai (2)  
Orange County (2)

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**SUPPLEMENTARY BRIDGE REPORT**  
DH-OS M19 (REV. 1/74)

14W14

Bridge No. 55C-38  
Location 7-Ora-FAS- L030-CR  
Dist - Co - Rte - PM - City  
Date of Investigation June 12, 1984

Name SANTIAGO CREEK (Santiago Canyon Road, 11 mile E. of Rte. 55)

CONDITION RATING:

APPRAISAL RATING:

Deck 7 Superstructure 8 Substr. & Pipes 8 Overall 7  
Channel & Channel Protection 6 Retaining Walls N

Widenable? Yes ☒ No ☐ Conditional ☐

Action Required by County Yes ☐ No ☒

PRIORITY

A - Immediate Action  
B - Early Scheduling  
C - Routine Maint.  
O - For Record Only

CONDITION OF STRUCTURE:

The overall condition of the structure is good.

RECOMMENDED POSTING:

None

RECOMMENDATION:

None

ELN:pdh  
cc: DRHiggins (2)  
Orange County (2)

*E. L. Neff*  
E. L. Neff  
C-28703

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
SUPPLEMENTARY BRIDGE REPORT  
DH-35 M19 (REV. 1/74)

Bridge No. 550-38  
Location 07-Cra-FAS L030-CR  
Dist - Co - Rte - PM - City (On deck)  
Date of Investigation October 19, 1981

Name SANTIAGO CREEK (Santiago Canyon Road - 11 miles east of Route 55)

CONDITION RATING:

APPRAISAL RATING:

Deck 7 Superstructure 8 Substr. & Pipes 8 Overall 7  
Channel & Channel Protection 6 Retaining Walls N

Widenable? Yes ☒ No ☐ Conditional ☐

County: Orange  
Action Required by District: Yes ☐ No ☒

WORK DONE:

The previously recommended work has been done.

CONDITION OF STRUCTURE:

The overall condition of the structure is good.

RECOMMENDED POSTING:

None.

*E. L. Neff*  
E. L. Neff  
C 28703

ELN:cd  
cc: DRHiggins (2)  
Orange County (2)

Bridge No. 529-38  
Other No. \_\_\_\_\_  
P.U.C. No. \_\_\_\_\_  
Location 67-000-745-1030-00  
Dist - Co - Rte - PM - City  
Date of Investigation July 24, 1979



Name SANTIAGO CREEK (Santiago Canyon Road- 11 miles east of Rte 55)  
Lat. 33°-44.8' Long. 117°-40.5'

STRUCTURAL DATA AND HISTORY

Year Built 1963 By Orange County Contract No. 63-72403-2

Date of Revisions \_\_\_\_\_

Designed by: B.D. ☐ Orange County Plans Avail. @ L.D.

Description: 25 "T" beam on single column piers and cant type abutments  
all on spread footings.

Spans 1 @ 49'; 2 @ 63'; 1 @ 49'  
Length 208' Skew Radial Design LL HSR-81.6-44  
Ratings: Inventory HSR5/LF Operating HSR2/LF Permit HSR77/LF

DESCRIPTION - ON STRUCTURE

Bridge Width 30'  
Total Width 30.58' Lanes 2 Tracks None  
Median None Rail Type None  
Vert. Clearance over deck Unimpaired Appr. Rdwy. Width 40'  
Wearing Surface None Deck Seal None  
Alignment 1000' radius curve

DESCRIPTION - UNDER STRUCTURE

Roadway Section None  
Clearances: Vert. \_\_\_\_\_ Horiz. \_\_\_\_\_ Lt. \_\_\_\_\_ Rt. \_\_\_\_\_  
Lanes \_\_\_\_\_ Tracks \_\_\_\_\_ Pumpplant: ☒ See Br. No. \_\_\_\_\_  
Facilities Crossed Santiago Creek

cc:

(1) CON'T.

Bridge No. **250-30**

Date **7-24-79**

DESCRIPTION - HYDRAULICS

Channel **poorly defined, unimproved. Rigrap at both abutment slopes.**

Navigable: Yes ☐ No ☒ Clearances: Vert. ☒ Horiz. ☒

MAINTENANCE

Custodian **Orange County**

Owner **Orange County**

ORIGINAL  
CONDITION RATING

|                              |           |
|------------------------------|-----------|
| Deck                         | <u>7</u>  |
| Superstructure               | <u>8</u>  |
| Substructure & Pipes         | <u>8</u>  |
| Channel & Channel Protection | <u>6</u>  |
| Retaining Walls              | <u>8</u>  |
| Approach Rdwy. Alignment     | <u>4</u>  |
| Estimated Remaining Life     | <u>40</u> |

ORIGINAL  
APPRAISAL

|                          |                 |
|--------------------------|-----------------|
| Overall                  | <u>7</u>        |
| Deck Geometry            | <u>7</u>        |
| Underclearances          | Vert. <u>8</u>  |
|                          | Horiz. <u>8</u> |
| Safe Load Capacity       | <u>9</u>        |
| Waterway Adequacy        | <u>6</u>        |
| Approach Rdwy. Alignment | <u>4</u>        |

Widenable? Yes ☒ No ☐ Conditional ☐

Action Required by **SHRINK** Yes ☒ No ☐

**AVERAGE DAILY TRAFFIC: 4000 + (1979)**

**REPAIRS SINCE INVENT: 36 miles**

**REMARKS:** 4" pipe attached to the north side of the bridge.  
12" pipe attached beneath the south exterior girder.

**CONDITION OF STRUCTURE:** The top deck concrete has cracking and peeling. The south bridge rail has been damaged in two places (10' E and 70' E west of the east abutment). Minor vertical cracks in the superstructure and substructure concrete. Otherwise the structure is in good condition.

**LOAD CAPACITY:** The inventory, operating and permit ratings shown were obtained through the "Frame Size" program using the load factor (LF) method of analysis.

**RECOMMENDATIONS:** Repair south bridge railing.

Original signed by  
**Frank J. Walliser**

**FWJ:ET**  
**cc: Mr. Higgins**  
**File of Local Agt's**  
**Orange County (2)**

DIST 07 ROUTE CO.RD COUNTY 55 C STRU. NO 0038 POSTMILE . RATING WIDTH-FT 030.6 STRU TYPE CGC YR ORIG CONST 63

JUN. 04, 1979

INFLUENCE LINE FOR CRITICAL INVENTORY RATING POINT SPAN 3 10TH POINT 5

| MEM NO | LEFT | .1     | .2     | .3     | .4     | .5     | .6     | .7     | .8     | .9     | RIGHT |
|--------|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-------|
| 1      | 0.0  | 0.065  | 0.126  | 0.179  | 0.220  | 0.246  | 0.252  | 0.234  | 0.189  | 0.112  | 0.0   |
| 2      | 0.0  | -0.211 | -0.480 | -0.769 | -1.037 | -1.245 | -1.354 | -1.323 | -1.113 | -0.686 | 0.0   |
| 3      | 0.0  | 1.058  | 2.579  | 4.562  | 7.009  | 9.921  | 7.000  | 4.546  | 2.561  | 1.045  | 0.0   |
| 4      | 0.0  | -0.538 | -0.906 | -1.124 | -1.209 | -1.180 | -1.057 | -0.859 | -0.604 | -0.312 | 0.0   |

THE CRITICAL OPERATING RATING POINT IS THE SAME AS THE CRITICAL INVENTORY RATING POINT

INFLUENCE LINE FOR CRITICAL PURPLE RATING POINT SPAN 3 10TH POINT 0

|   |     |        |        |        |        |        |        |        |        |        |     |
|---|-----|--------|--------|--------|--------|--------|--------|--------|--------|--------|-----|
| 1 | 0.0 | 0.194  | 0.375  | 0.534  | 0.657  | 0.733  | 0.751  | 0.698  | 0.563  | 0.334  | 0.0 |
| 2 | 0.0 | -0.630 | -1.434 | -2.296 | -3.097 | -3.718 | -4.042 | -3.950 | -3.324 | -2.047 | 0.0 |
| 3 | 0.0 | -3.171 | -5.190 | -6.119 | -6.261 | -5.759 | -4.797 | -3.557 | -2.222 | -0.976 | 0.0 |
| 4 | 0.0 | 0.518  | 0.872  | 1.081  | 1.163  | 1.136  | 1.018  | 0.827  | 0.582  | 0.300  | 0.0 |

2 SANTIAGO CREEK  
3 RATE FULL WIDTH (TBEAM)  
4 4 SPANS CONT 49FT, 2063FT, 49FT X 4.08FT DEPTH  
5 NO AC 6/16/76, GIRD SPAC 406.58FT

(E)

gra-co

DIST 07 ROUTE CO.RD 55 C COUNTY 55 C STRU. NO 0038 POSTMILE . RATING 030.6 WIDTH-FT 030.6 STRU TYPE CGC YR ORIG CONST 63 JUN. 04, 1979

|      | RATING<br>FACTOR | PT | SPAN | ULT MOM<br>TOP IN COM | CAP<br>BOT IN COM | POS HS20<br>MOMENT | NEG HS20<br>MOMENT | POS PURP<br>MOMENT | NEG PURP<br>MOMENT | DEAD LOAD<br>MOMENT | SECONDARY<br>MOMENT |
|------|------------------|----|------|-----------------------|-------------------|--------------------|--------------------|--------------------|--------------------|---------------------|---------------------|
| INV  | 1.27             | 5  | 3    | 5559.5                | 0.0               | 1549.8             | -338.8             | 2368.4             | -458.6             | 1000.5              | 0.0                 |
| OPER | 2.11             | 5  | 3    | 5559.5                | 0.0               | 1549.8             | -338.8             | 2368.4             | -458.6             | 1000.5              | 0.0                 |
| PURP | 1.20             | 0  | 3    | 0.0                   | 6786.0            | 232.7              | -1206.0            | 343.5              | -2969.0            | -1644.0             | 0.0                 |

THE NUMBER OF AXLES ON THE TRUCK THAT CAUSES THE PURPLE RATING FACTOR IS 13.  
FC = 1.20 FY = 40.

IF THE REPORTED ULTIMATE MOMENT CAPACITY IS 0, IT WAS DETERMINED NOT TO BE CRITICAL

- 2 SANTIAGO CREEK
- 3 RATE FULL WIDTH (TBEAM)
- 4 4 SPANS CONT 49FT, 2063FT, 49FT X 4.08FT DEPTH
- 5 NO AC 6/16/76, GIRD SPAC 406.58FT

P, P, P, P, P

(E)

STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
SUPPLEMENTARY BRIDGE REPORT  
DH-OS M19 (REV. 1/74)

Bridge No. 55C-38  
Location 07-Ora-FAS 1279-17.7  
Dist - Co - Rte - PM - City  
Date of Investigation June 16, 1976

Name SANTIAGO CREEK

CONDITION RATING:

APPRAISAL RATING:

Deck 7 Superstructure 7 Substr. & Pipes 7 Overall 7  
Channel & Channel Protection 7 Retaining Walls -

Widenable? Yes ☒ No ☐ Conditional ☐

County IMPERIAL  
Action Required by DMV: Yes ☐ No ☒

CONDITION OF STRUCTURE:

This structure is in good condition.

RAIL RATING:

(1010)

RECOMMENDATIONS:

None.

*A. L. Clemence*  
A. L. Clemence

ALC:ic



Bridge No. 55C-38  
Location 7-Oran-FAS 1279-17.7  
Dist - Co - Rte - PM - City  
Date of Investigation July 16, 1974

Name SANTIAGO CREEK

CONDITION RATING:

APPRAISAL RATING:

Deck 7-F7 Superstructure 7-F7 Substr. & Pipes 7-F7 Overall 7-F7  
Channel & Channel Protection 7-F7 Retaining Walls NA

Widenable? Yes ☒ No ☐ Conditional ☐

Action Required by District: Yes ☐ No ☒

CONDITION OF STRUCTURE:

The overall condition is good. No changes were noted.

CAPACITY RATING:

Unchanged. P-13

RECOMMENDATIONS:

None

Original signed by  
W. R. Baker

WRB:ah  
cc: Orange County (2)

STATE OF CALIFORNIA

BRIDGE REPORT

See REISSUED

ORIGINAL REPORT

SC-9

Sheet 1 of 3

Bridge No. 55C-038

Date of Investigation 3/28/72

Location 7-ORA-FAS1279-17.7  
DIST-CO-RTE - CITY - P.M.

Name Santiago Creek

Location On Santiago Canyon Rd. 0.2 mi NWly of Silverado Canyon Rd.

Latitude 33°-44.8' Longitude 117°-40.5' DOD Rd SECTION Br. LETTER

Custodian County Owner County

CLASSIFICATION 00 13

Federal Aid System 07 Administrative 4 Functional 3

## STRUCTURAL DATA AND HISTORY

Year Built 1963 By County Cont. No. 63-7Y24C3-P FAP No. FAS 1279 (3)

Designed by County Plans Avail Yes at State (BD)

Spans 1@49', 2@63', 1@49' Length 228' Skew Radial

Description RC T-beam on single column piers and seat type abutments all on spread footings.

## On Structure

Roadway Section 2@15.0' Total Width 30'-7"

Flex Flex  
Rail Type Lt. beam Rt. beam Median None Lanes 2 Tracks -

Clearances: Vert. Unimpaired Horiz. 30'-0" PUC No. -

Design LL H20-S16-44 Capacity Rating P-13

## Under Structure

Roadway Section - Lanes - Tracks -

Clearances: Vert. - Horiz. - PUC No. -

## HYDRAULIC STRUCTURE

Report? Yes ☒ No ☐ Nav. Control Yes ☐ No ☒ Clear. Diag. Yes ☒ No ☐

Relief Structures Orange County Flood Control District

## APPRAISAL OF NON-STRUCTURAL FACTORS

Deck Geometry 7 Approach Alignment 6

Waterway Adequacy 7 Clearances: Vert. 9 Horiz. 6

STATE OF CALIFORNIA

## BRIDGE REPORT

ADT .....1000..... Year .....1971.....

## RATING OF CONDITION:

Deck .....7.....

Substructure .....7.....

Superstructure .....7.....

Overall .....7.....

PREVIOUS REPORTS:

Refer to office report dated, August 22, 1963.

EXISTING POSTING:

None.

CONDITION OF STRUCTURE:

There are longitudinal and transverse cracks at 1-2 foot centers in the deck surface.

The deck soffit has some longitudinal and transverse cracks with no leaching in the deck soffit.

The girder stems have vertical hairline cracks at 2-3 foot centers.

ENCROACHMENT:

1 - 12 inch mortar encased pipe suspended from Girder 1.

CHANNEL:

The channel has been improved and has a sand-gravel bed with rock slope protection. The abutments from the old structure are still in place under the new structure. The new structure has straight concrete wingwalls.

CAPACITY:

The structure is considered safe for legal loads by design and inspection, and it will carry a P-13 overload.

POSTING RECOMMENDATION:

None.



W.R. SCHOTT  
C. E. Lic. No. 13592

BRIDGE NO. 55C-038

7. ORA. FAS1279

P.M. 17.73

DIST. CO. RTE.

BRIDGE Santiago Canyon Creek

PROFILE Left SIDE

MEASURED FROM : Top of RC deck .

DATE 3/28/72

| From BB         | Horz. | Vert.           | Comment                              |
|-----------------|-------|-----------------|--------------------------------------|
| Face of Abut #1 |       | 7 <sup>6</sup>  |                                      |
|                 | 16°   | 8 <sup>4</sup>  | Top of old abut.                     |
|                 | 16°   | 14 <sup>5</sup> | Base of old abut.                    |
| Pier #2         |       | 24 <sup>4</sup> |                                      |
| Pier #3         |       | 24 <sup>8</sup> |                                      |
| Pier 4          |       | 19 <sup>5</sup> |                                      |
|                 | 22°   | 15 <sup>2</sup> | Base of old abut                     |
|                 | 32°   | 7 <sup>2</sup>  | Top of old abut                      |
| Face of Abut #5 |       | 7 <sup>6</sup>  |                                      |
|                 |       |                 | Improved channel - sand & gravel bed |

Santiago Creek  
55C-038

WRS  
WRK

3-28-72  
7/72

1 of 3

Safe Load Calculations - AASHTO Maint. Manual 1970

4 span continuous T-beam

Good for legal loads by design (H20-316-44) -

Design stress:  $f_s = 20,000 \text{ psi}$ ,  $f_c = 1200 \text{ psi}$ ,  $n = 10$  -

Overload stress:  $f_s = 25,000 \text{ psi}$ ,  $f_c = 1650 \text{ psi}$ ,  $n = 10$  -

LL Distribution =

Interior girder =  $6.50 / 6.00 = 1.10 \text{ w/g}$  controls -

Exterior girder =  $(5' + 6'5") / 6'7" = 1.04 \text{ w/g}$

Impact  $(L = 63') = 1.266$   $(L = 49') = 1.287$

Dead Load

Deck =  $6.58 \times 0.50 \times 0.150 = 0.494 \text{ k/ft}$

Fillets =  $0.33 \times 0.33 \times 0.150 = 0.016$

Girder =  $1.08 \times 3.58 \times 0.150 = 0.580$

Diaphragm =  $0.83 \times 5.50 \times 3.50 \times 0.150 / 49 = 0.049$

163 = 0.058

End 5

Center 5

~ 1.14 k/ft

Moments from influence lines  $3/4 L, L, L \text{ \& } 3/4 L$  (SP 10M)

DL Moments

0.4 Span 1 =  $1.14 \times 0.0367 \times 63^2 = 166 \text{ k-ft}$

0.5 Span 2 =  $1.14 \times 0.0432 \times 63^2 = 196 \text{ k-ft}$

@ Bent 2 =  $1.14 \times 0.0769 \times 63^2 = 348 \text{ k-ft}$

@ Bent 3 =  $1.14 \times 0.0866 \times 63^2 = 392 \text{ k-ft}$

LL + I Moments (P13 Unit)

0.4 Span 1 =  $1.287 \times 1.10 \times 63 \times 24 \times (0.004 + 0.157 + 0.044) = 439 \text{ k-ft}$

(P.7) 0.5 Span 2 =  $1.266 \times 1.10 \times 63 \times 24 \times (-0.005 + 0.047 + 0.168 + 0.046) = 543 \text{ k-ft}$

(P13) Bent 2 =  $1.266 \times 1.10 \times 63 \times 24 \times (0 + 0.058 + 0.054 + 0.050 + 0.001 + 0.055 + 0.009) = 657 \text{ k-ft}$

Bent 3 =  $1.266 \times 1.10 \times 63 \times 24 \times (0 + 0.050 + 0.084 + 0.050 + 0.055 + 0.082 + 0.047) = 775 \text{ k-ft}$

Santiago Creek  
55C-038

wrs  
WRK

3-28-72  
7/72

2 of 3

T-Beam Capacity  
+ M Span 1

(neglect stress in stem)  $A_s = 8.24 \text{ in}^2$ ,  $d = 46"$

$$f_s = \frac{12000(166 + 439)}{.875 \times 46 \times 8.24} = 22,000 \text{ psi OK}$$

$$k = \frac{\frac{n A_s}{b t} + \frac{1}{2} \frac{t}{d}}{\frac{n A_s}{b t} + 1.000} = \frac{\frac{10 \times 8.24}{79 \times 6} + \frac{1}{2} \times \frac{6}{46}}{0.174 + 1.000} = \frac{0.174 + 0.065}{1.174} = 0.203$$

$$f_c = \frac{22,000}{10} \times \frac{.203}{.797} = 560 \text{ psi OK}$$

+ M Span 2 (neglect stress in stem)  $A_s = 8.24 \text{ in}^2$ ,  $d = 46"$

$$k = 0.203 \quad t/d = 0.130 \quad j = (\text{Table 9 ACI}) = 0.945$$

$$f_s = \frac{12000(196 + 543)}{.945 \times 46 \times 8.24} = 24,800 \text{ psi OK}$$

$$f_c = 2480 \times .25 = 620 \text{ psi OK}$$

- M Bent 2  $A_s = 6.411 + 2.49 = 11.36 \text{ in}^2$ ,  $A_s' = 2.411 + 2.49 = 5.12$   
 $d = 46 \frac{3}{8}"$ ,  $d' = 2 \frac{1}{8}"$

$$m = \frac{10 \times 11.36}{13 \times 46.6} + \frac{19 \times 5.12}{605} = 0.188 + 0.160 = 0.348$$

$$z = 0.188 + 0.160 \times \frac{2.88}{46.6} = 0.188 + 0.160 \times 0.0618 = 0.198$$

$$k = 0.370 \quad \frac{0.160}{0.370} = 0.43 \quad \frac{.0618}{.370} = 0.167$$

$$z = 0.26 \quad j = 0.90$$

$$f_s = \frac{12000(348 + 657)}{0.90 \times 46.6 \times 11.36} = 25,400 \text{ psi OK}$$

$$f_c = \frac{25,400}{10} \times \frac{.37}{.63} = 1490 \text{ psi OK}$$

Santiago Creek  
55C-03B

WRS  
WRE

3-28-72  
7/72

3 of 3

- M Bent 3

$$A_s = 8 \#11 = 14.04 \text{ in}^2, A_s' = 4 \#11 = 6.24 \text{ in}^2, d = 46 \frac{5}{8}, d' = 2 \frac{7}{8}$$

$$m = \frac{10 \times 14.04}{605} + \frac{19 \times 6.24}{605} = 0.232 + 0.196 = 0.428$$

$$e = 0.232 + 0.196 \times 0.0618 = 0.232 + 0.012 = 0.244$$

$$k = 0.39 \quad \frac{.196}{.39} = 0.50 \quad \frac{0.0618}{0.39} = 0.16$$

$$e = 0.25 \quad j = 0.905$$

$$f_s = \frac{12000(392 + 775)}{0.905 \times 46.6 \times 14.04} = 23,700 \text{ psi OK}$$

$$f_c = \frac{23,700 \times .39}{10 \times .61} = 1520 \text{ psi OK}$$

Structure is adequate for P13 overhead



BRIDGE REPORT **SUPERSEDED**

Office Report

Date of Investigation Aug. 22, 1963

## General Description

1963 AUG 30 AM 10 43

Name SANTIAGO CREEK VII-Ora-Co.Rd. (1279)

Location 6.8 Miles E. of Rte. <sup>22</sup>~~182~~ on Santiago Canyon Rd. Sta. 362+75

Description R.C. continuous (5) "T" girder spans on R.C. single column bents and R.C. straight abuts, all supported on spread footings.

Railing Metal beam bridge rail Approx. skew radial

Spans 1 @ 49.0'; 2 @ 63.0'; 1 @ 49.0'

Total length 227.7'

Roadway width 30.0' between metal beam rails

Describe median, shoulders, surf., etc.

Sidewalks None

Width adequate Alignment Final, 1200' curve

Design Live Loading H20-S16-44 Overload rating Purple

Waterway meandering, steep, rocky, seasonal flow

Other features crossed None

Vertical clearance Unimpaired for County Road

FINAL REPORT FILED *in Vol.*  
UNDER BR. NO. "5E"

## History

Date built 1963 By Orange County Contract No. 63-7Y24C3-P

Designed by Orange County Designer C. Boyce

Plans "As Built" in LA &amp; Sacto Br. files Bridge R.E. D. E. Bourgeois

Contractor Tomei Construction Company

REMARKS Office Report for filing purposes only.

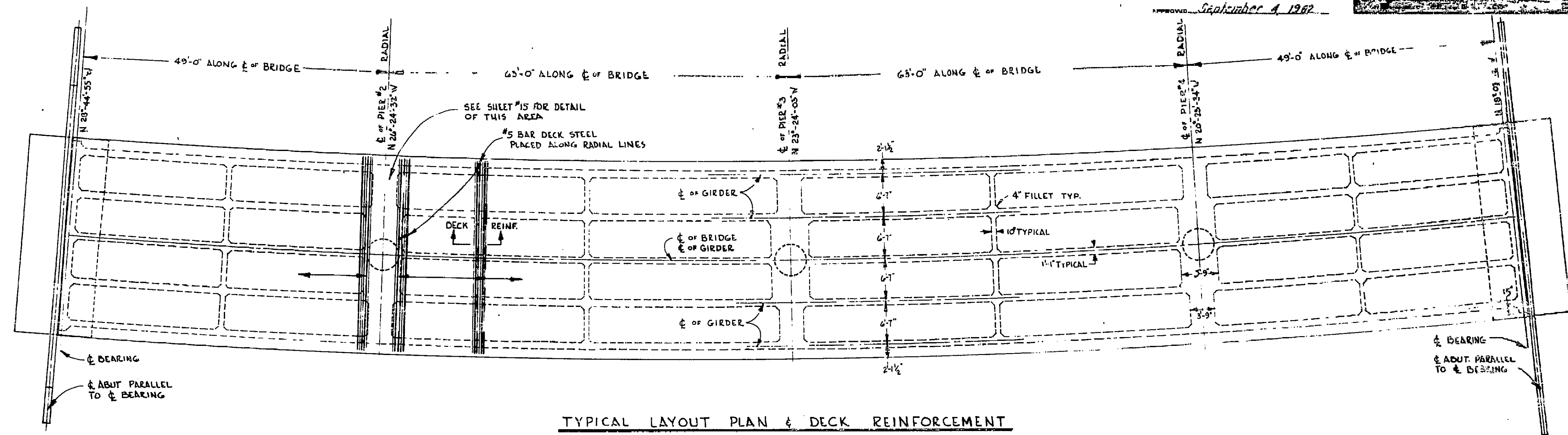
|               |
|---------------|
| BRIDGE        |
| A.S.H. ENG'R. |
| OFFICE ENG'R. |
| OPERATIONS    |
| DESIGN        |
| MAINTENANCE   |
| CHIEF CLERK   |
| FED. AID SEC. |
| AGREEMENTS    |
| RESEARCH      |
| STENOS        |

cc: District VII  
Maintenance Dept.

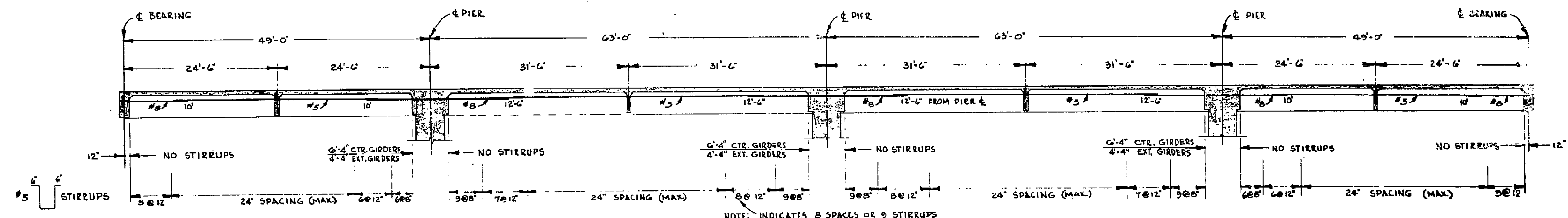
A. R. Rossing

|      |         |    |      |
|------|---------|----|------|
| DATE | 10/2/67 | BY | W.D. |
| DATE | 10/2/67 | BY | W.D. |
| DATE | 10/2/67 | BY | W.D. |
| DATE | 10/2/67 | BY | W.D. |

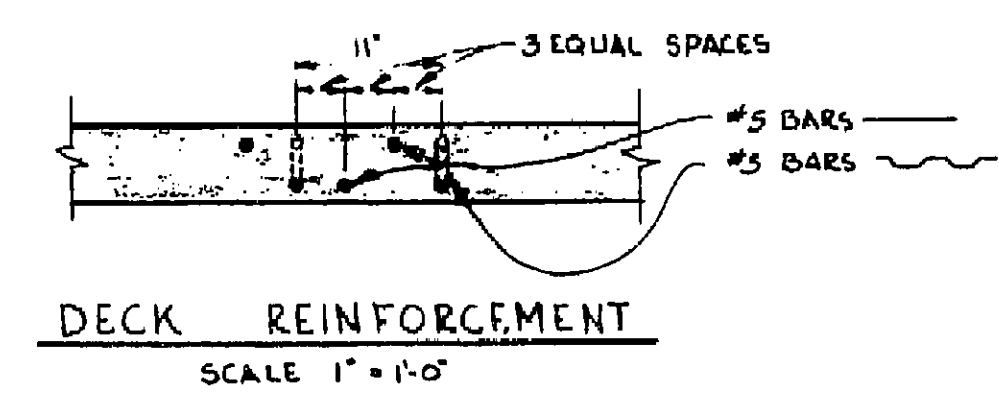
*W.D. [Signature]*  
 BRIDGE ENGINEER CIVIL ENGINEER—LICENSE 5782  
 APPROVED September 4, 1967



TYPICAL LAYOUT PLAN & DECK REINFORCEMENT



LONGITUDINAL SECTION & STIRRUP SPACING



DECK REINFORCEMENT  
 SCALE 1" = 1'-0"

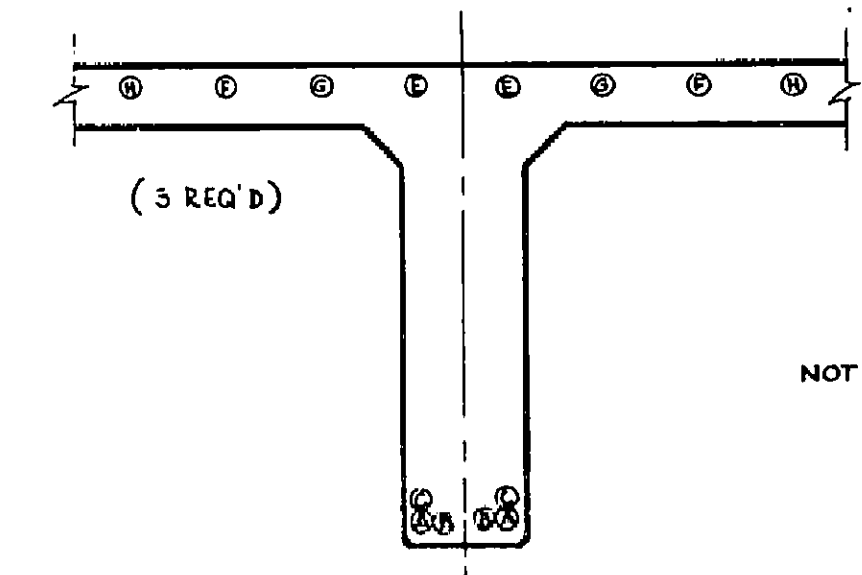
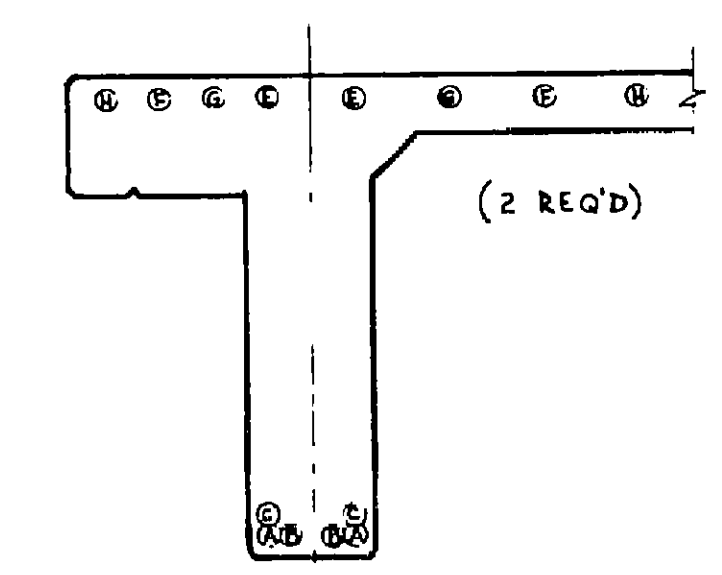
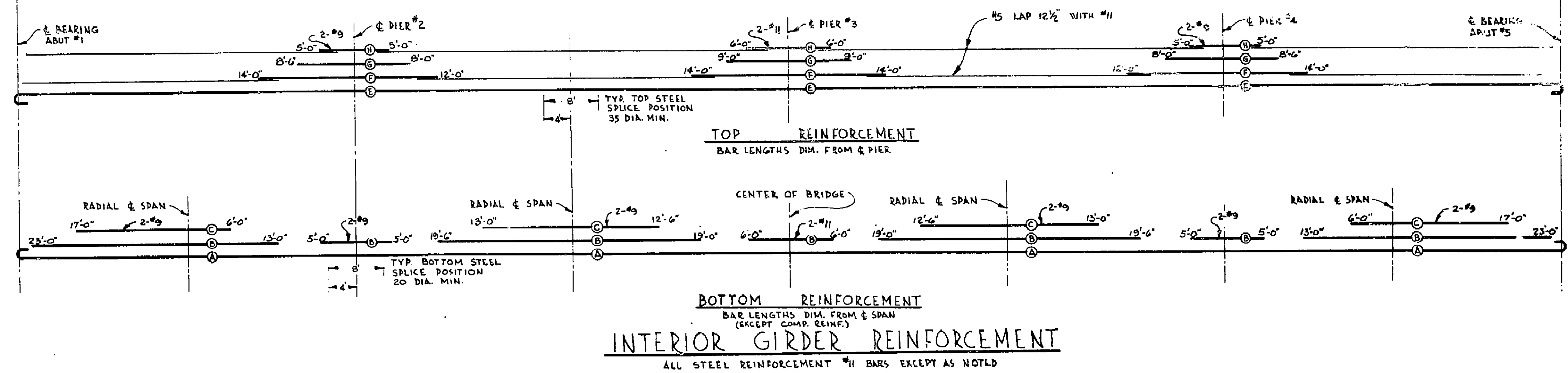
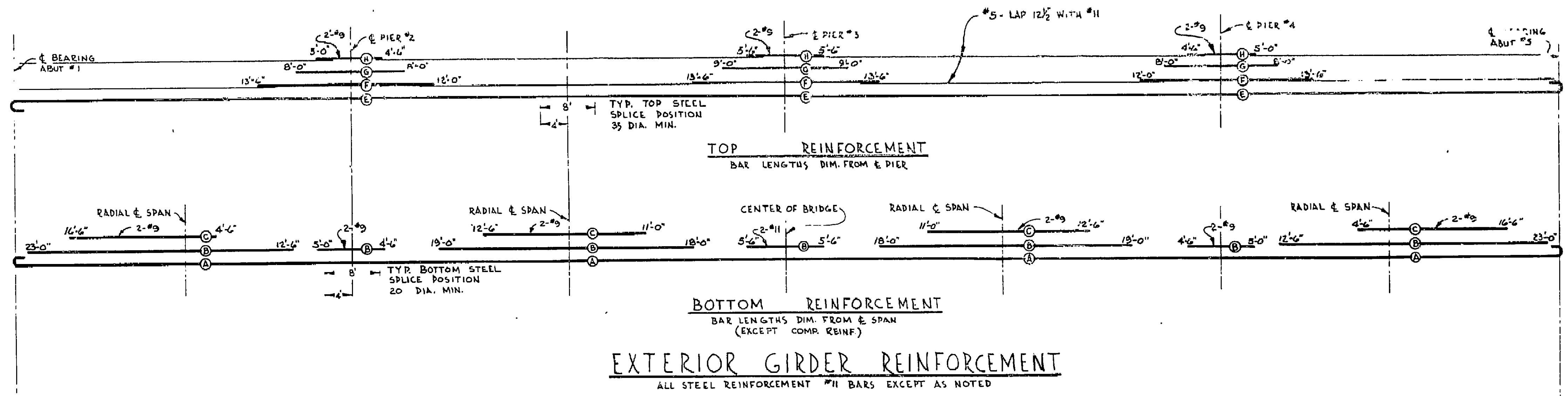
**AS BUILT**  
 CORRECTIONS BY D.E. Bougeois  
 CONTRACT NO. 62-TY2462-P  
 DATE 6/21/67

7-55C30-6  
 ORANGE COUNTY HIGHWAY DEPARTMENT  
**SANTIAGO CANYON**  
**BRIDGE SC-9**  
**SUPERSTRUCTURE**  
**LAYOUT**  
 SCALE 1/8" = 1'-0" SHEET 19 OF 25

Structural Design  
 Checked by [Signature]  
 Reviewed by [Signature]  
 Approved by [Signature]



*Frederick*  
 BRIDGE ENGINEER - CIVIL ENGINEER - LICENSE 8188  
 APPROVED September 4, 1962



NOTE:  
 LETTERS DENOTE POSITION,  
 NOT SIZE OF REINF. BAR.

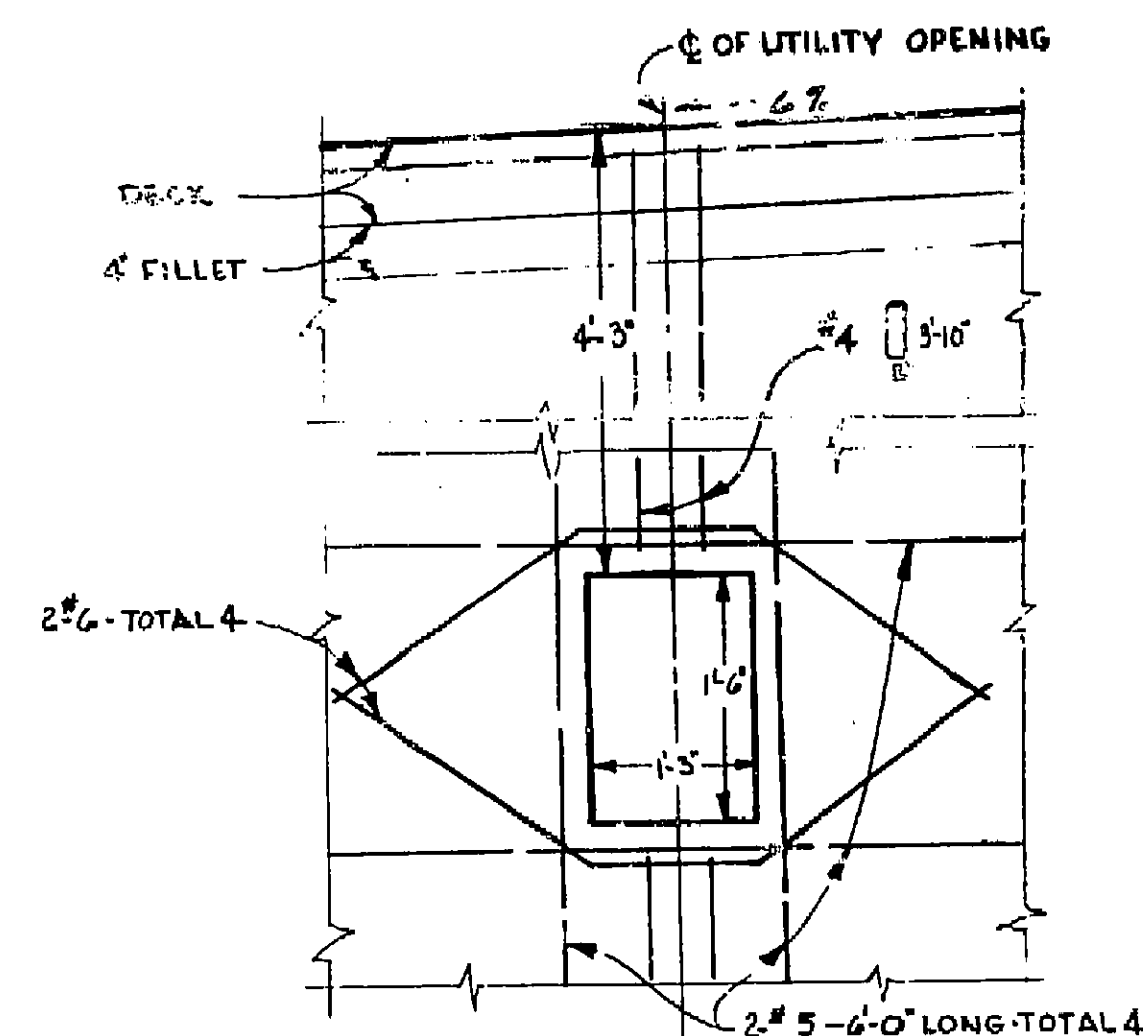
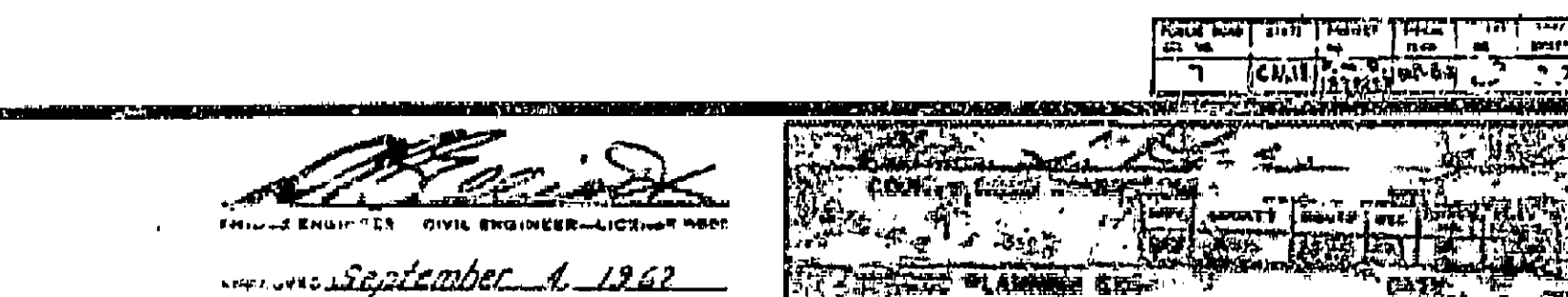
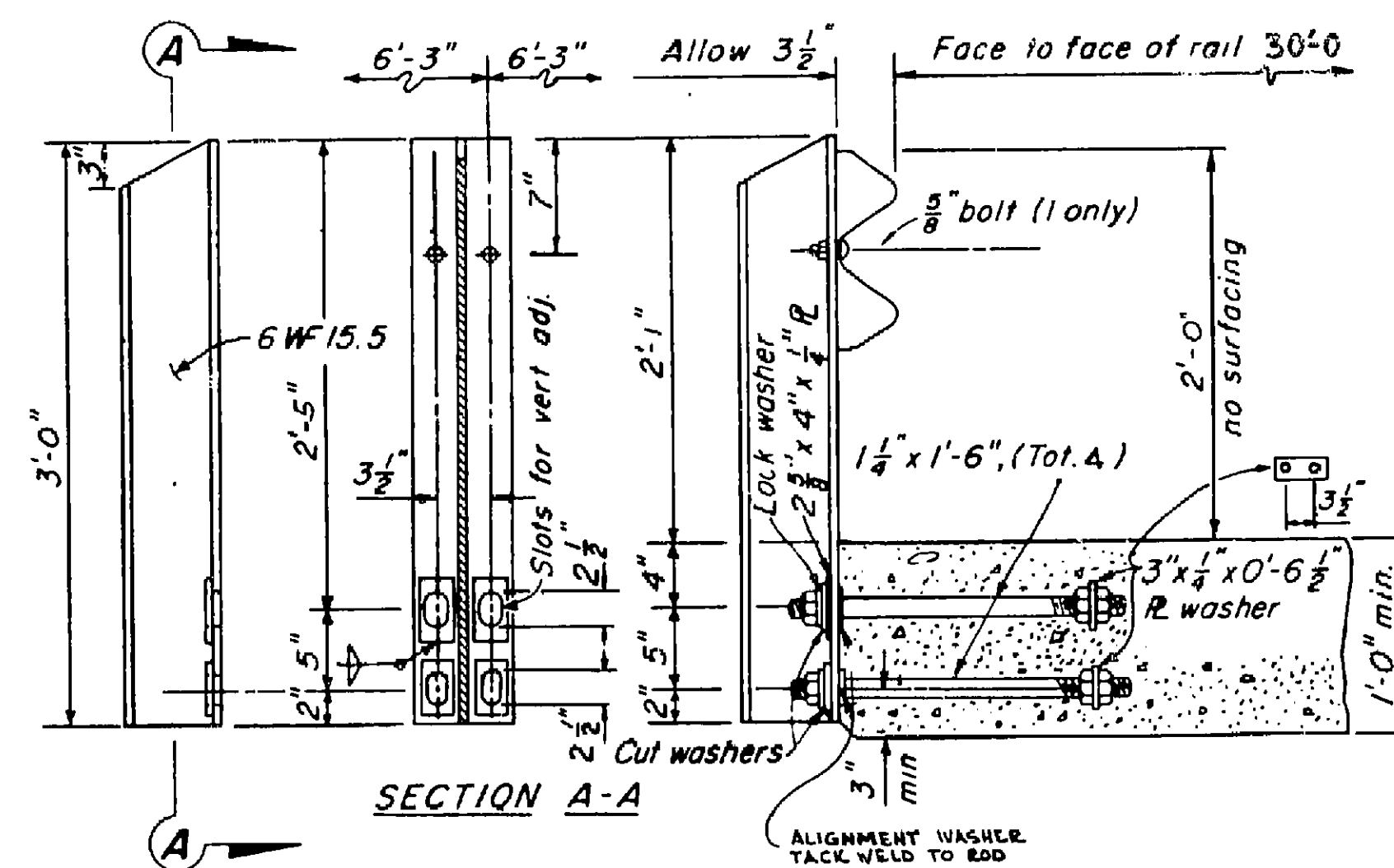
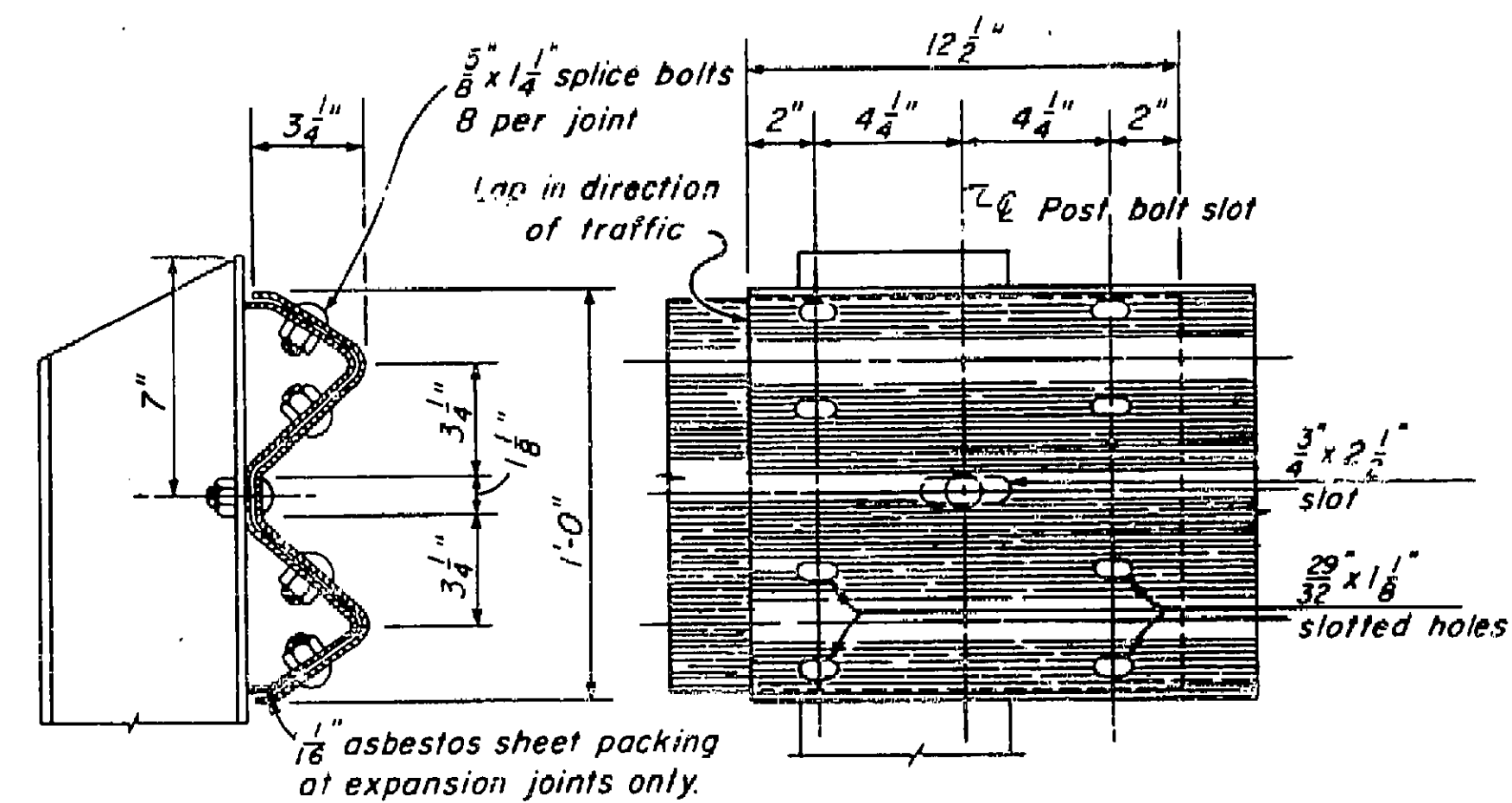
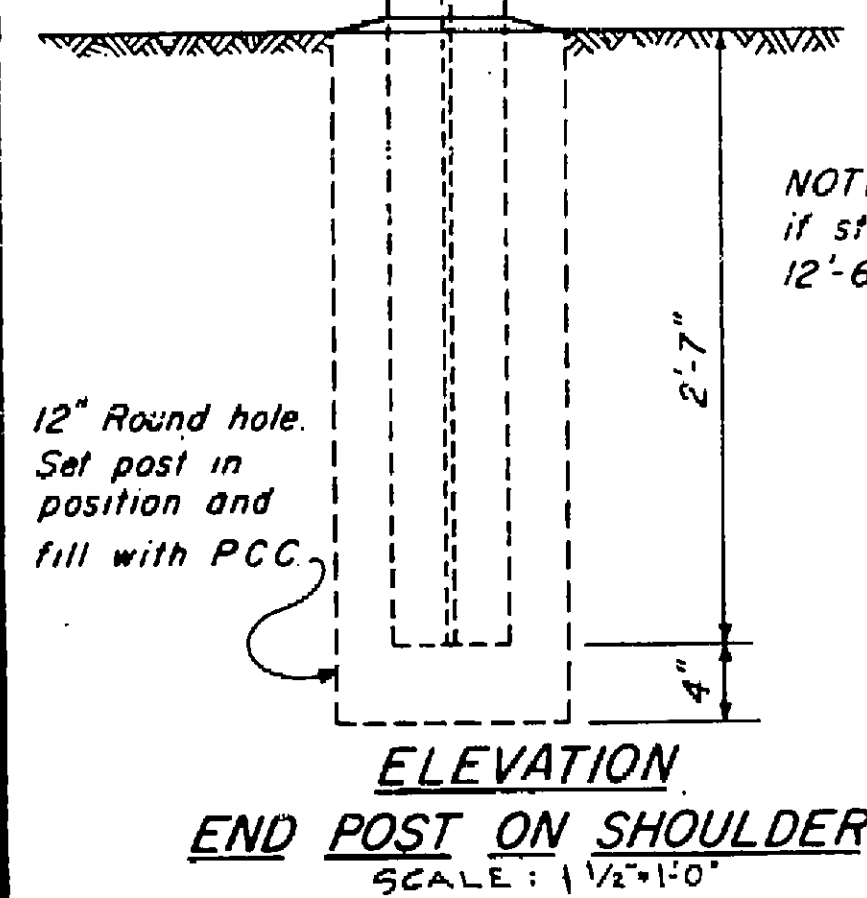
NOTE: (A), (B) AND (C) BARS ARE BUNDLED

**AS BUILT**  
 CORRECTIONS BY *DE Bourgcois*  
 CONTRACT NO. 63-7V2464-P  
 DATE 6/21/63

C-55C38-7  
 ORANGE COUNTY HIGHWAY DEPARTMENT  
 SANTIAGO CANYON  
 BRIDGE SC-9  
**GIRDER REINFORCEMENT**  
 SCALE 3/4" = 1'-0" SHEET 20 OF 28

Structural Details  
 Checked By *[Signature]*  
 Reviewed *[Signature]*  
 Approved *[Signature]*

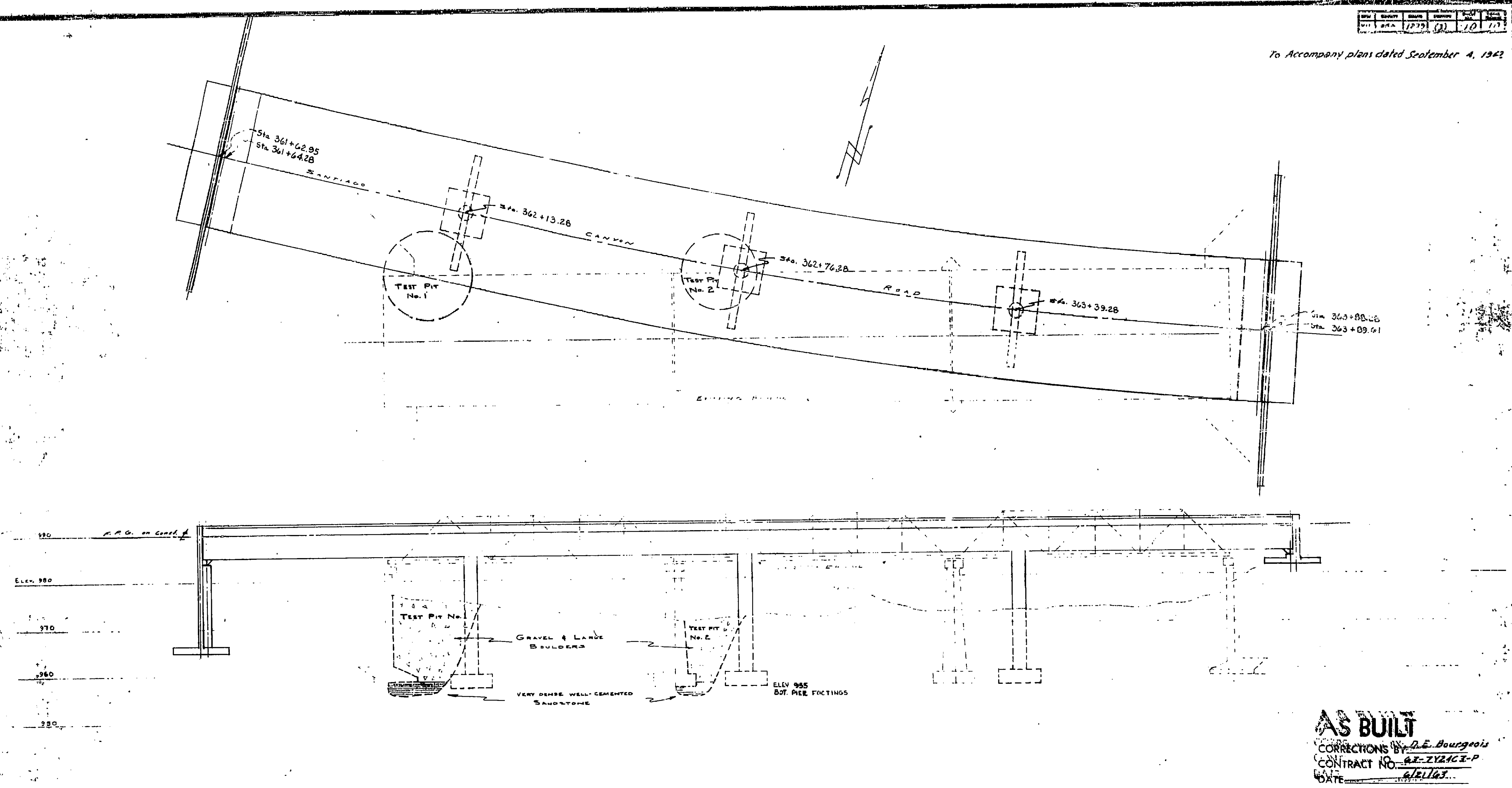




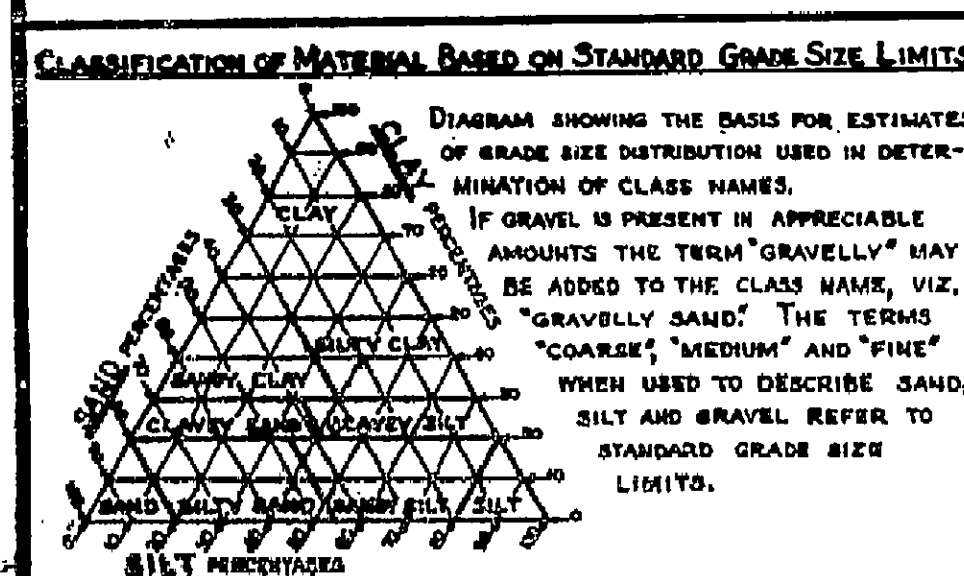
*C-55C38-9*

|                                                        |                                                                                                              |                |
|--------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|----------------|
| ORANGE COUNTY HIGHWAY DEPARTMENT                       |                                                                                                              |                |
| DATE<br>DRAWN<br>BY<br>CHECKED<br>BY<br>APPROVED<br>BY | <h1 style="margin: 0;">SANTIAGO CANYON<br/>BRIDGE SC-9</h1> <h2 style="margin: 20px 0 0 0;">RAIL DETAIL</h2> | SHEET 22 OF 22 |



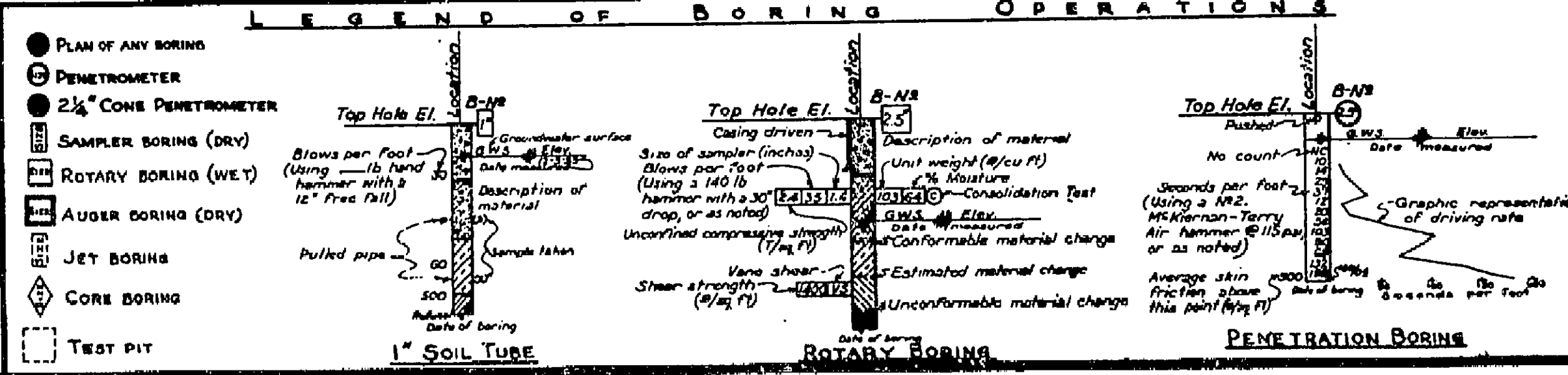


AS BUILT  
CORRECTIONS BY: D.E. Bourgeois  
CONTRACT NO. 67-2721C1-P  
DATE 6/21/67



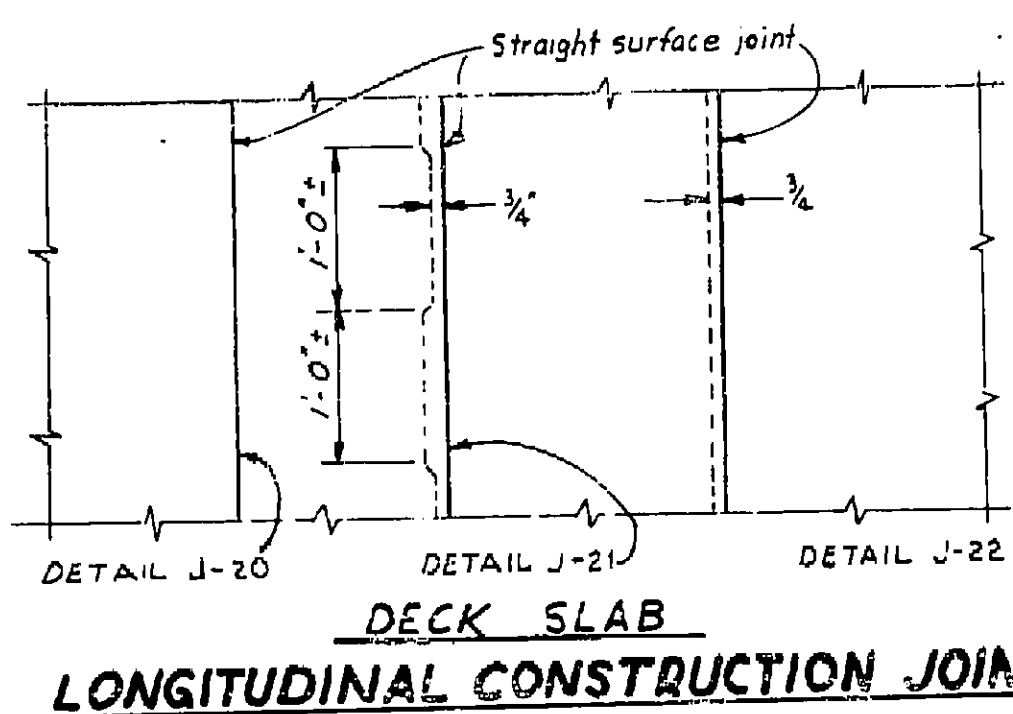
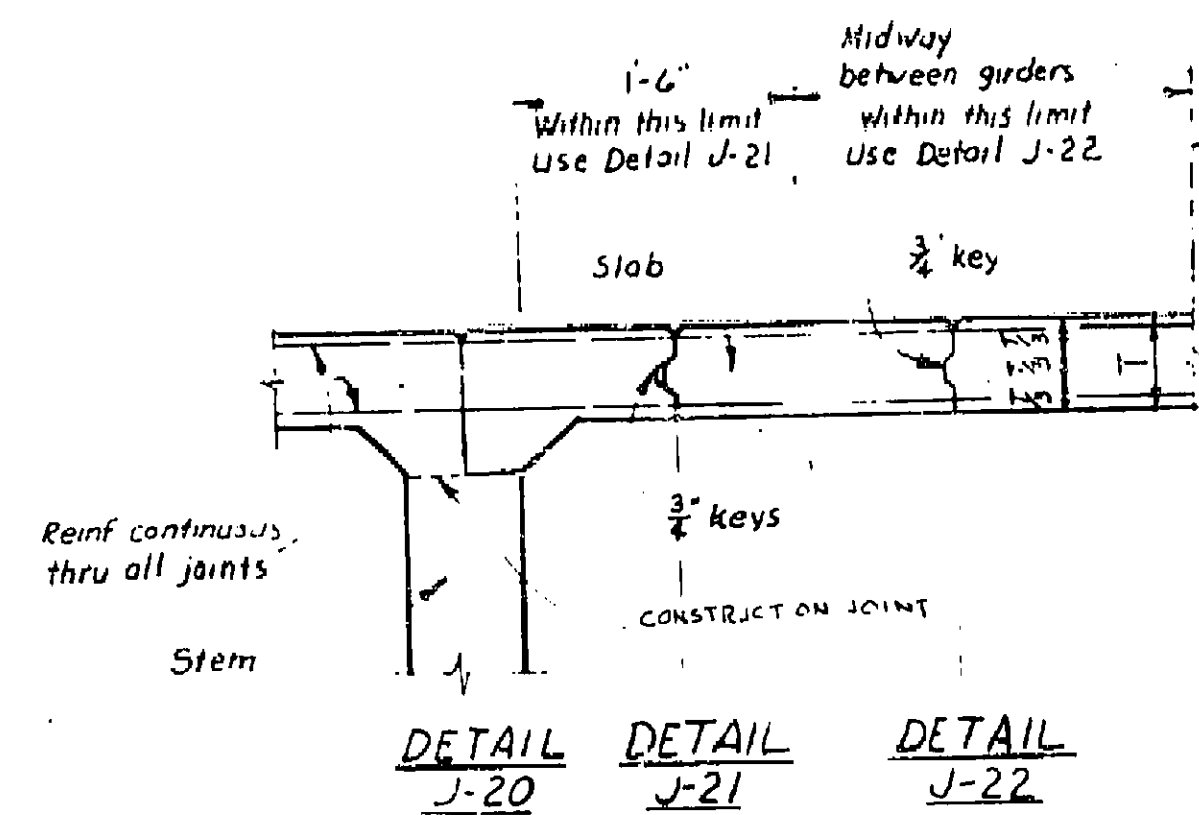
### LEGEND OF EARTH MATERIALS

|                                                                                                               |                                                                                                                |
|---------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|
|  GRAVEL                    |  SILTY CLAY OR CLAYEY SILT  |
|  SAND                      |  PEAT AND/OR ORGANIC MATTER |
|  SILT                      |  FILL MATERIAL              |
|  CLAY                      |  IGNEOUS ROCK               |
|  SANDY CLAY OR CLAYEY SAND |  SEDIMENTARY ROCK           |
|  SANDY SILT OR SILTY SAND  |  METAMORPHIC ROCK           |



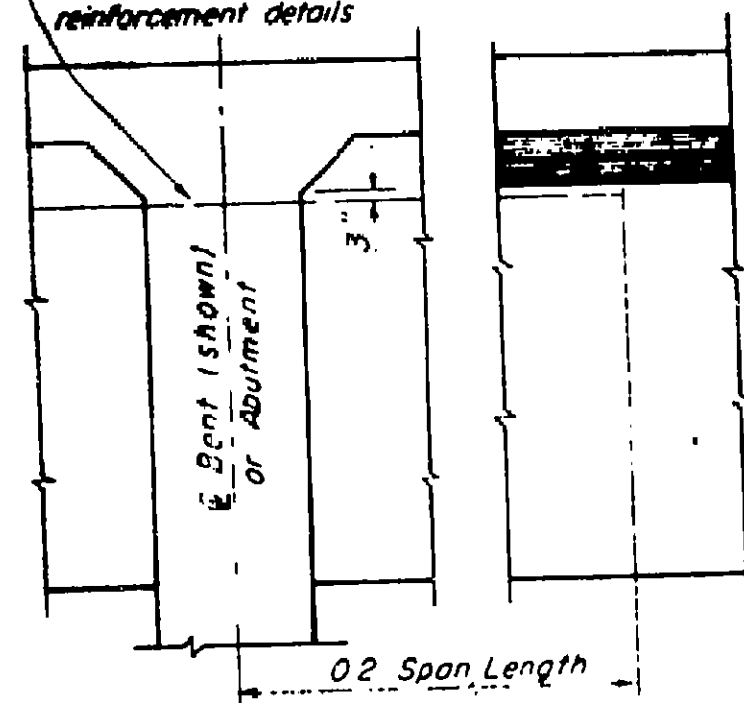
|                                                                |               |      |         |              |
|----------------------------------------------------------------|---------------|------|---------|--------------|
| FAS 1279 (3)                                                   |               |      |         |              |
| SANTIAGO CANYON ROAD<br>BRIDGE (SC - 9)<br>over Santiago Creek |               |      |         |              |
| LOG OF TEST BORINGS                                            |               |      |         |              |
| SCALE 1" = 100'                                                | BRIDGE 55C-88 | FILE | CHARTER | SHT. 25 of 2 |



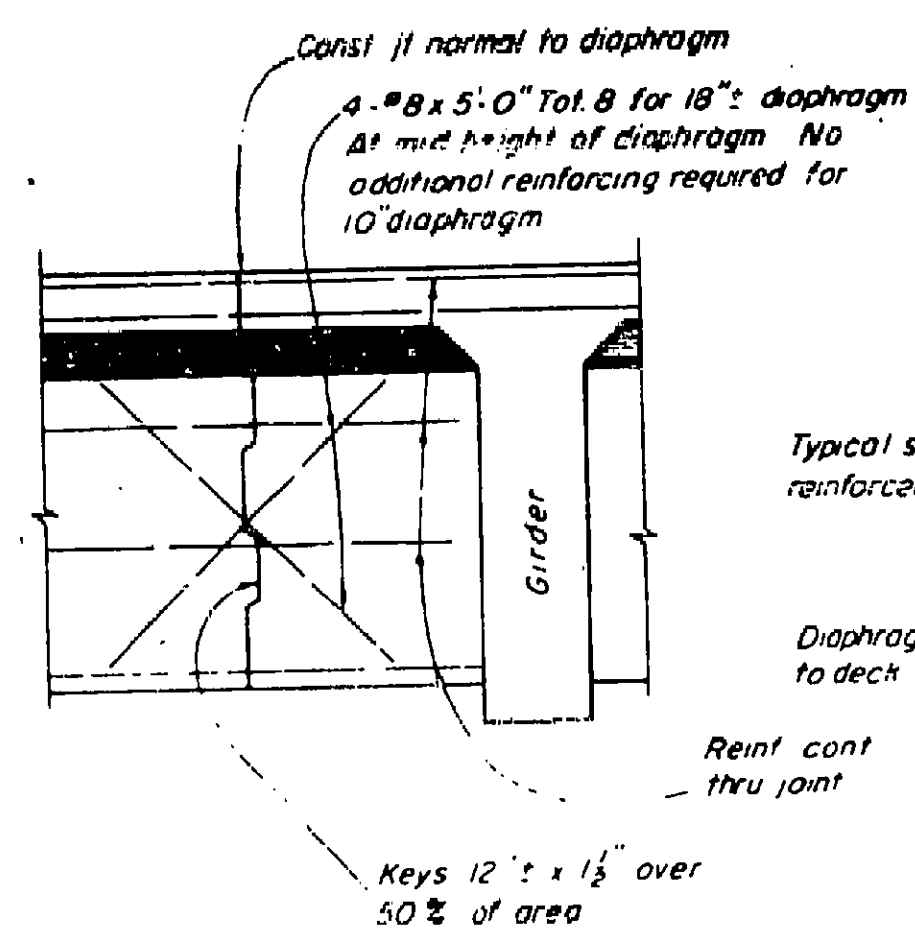


Note: Longitudinal construction joints in slab, if required, are to be located at edge of traffic lanes except as approved by the Engineer.

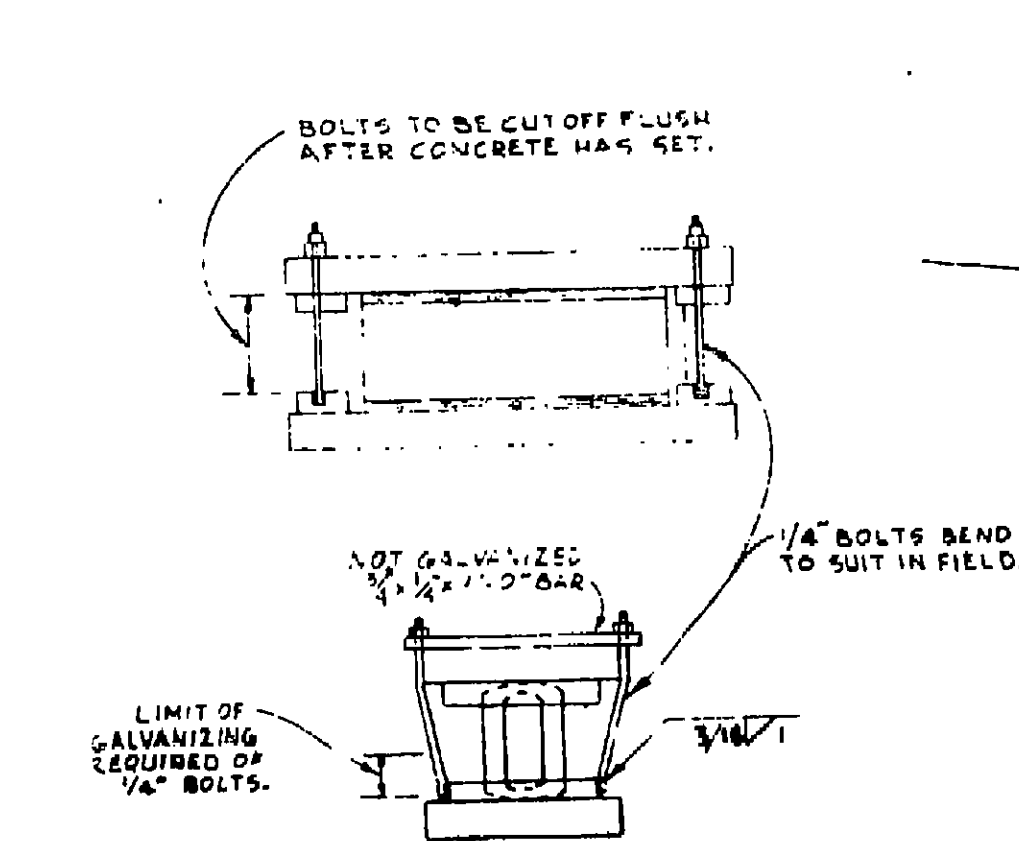
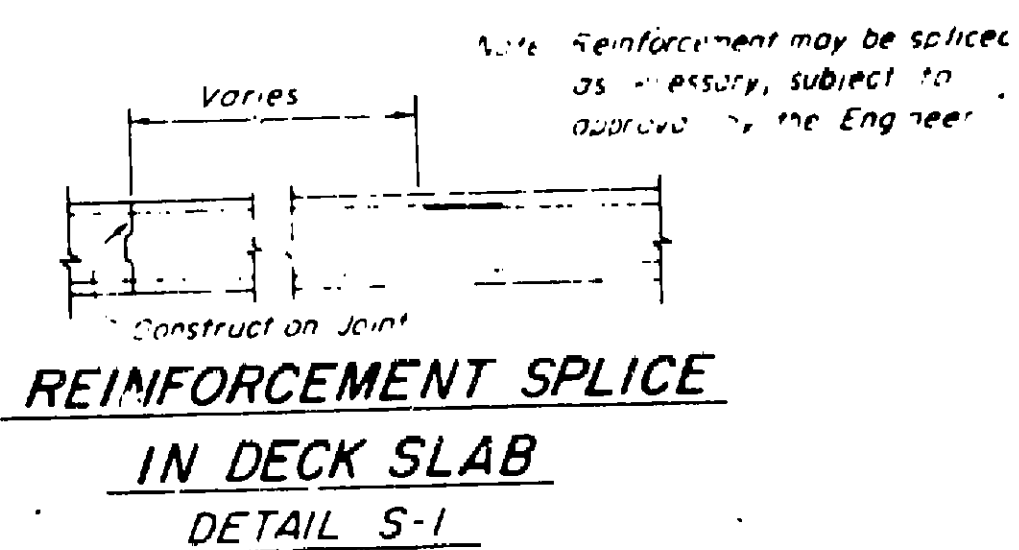
2" #8 in all bents and abutments. At bent locate between the 0.2 point of one span and the 0.2 point of the next span. At the abutments locate from the back face of abutment to the 0.2 point of the adjacent span. For any exceptions, see the reinforcement details.



REINFORCEMENT  
DETAIL J-1

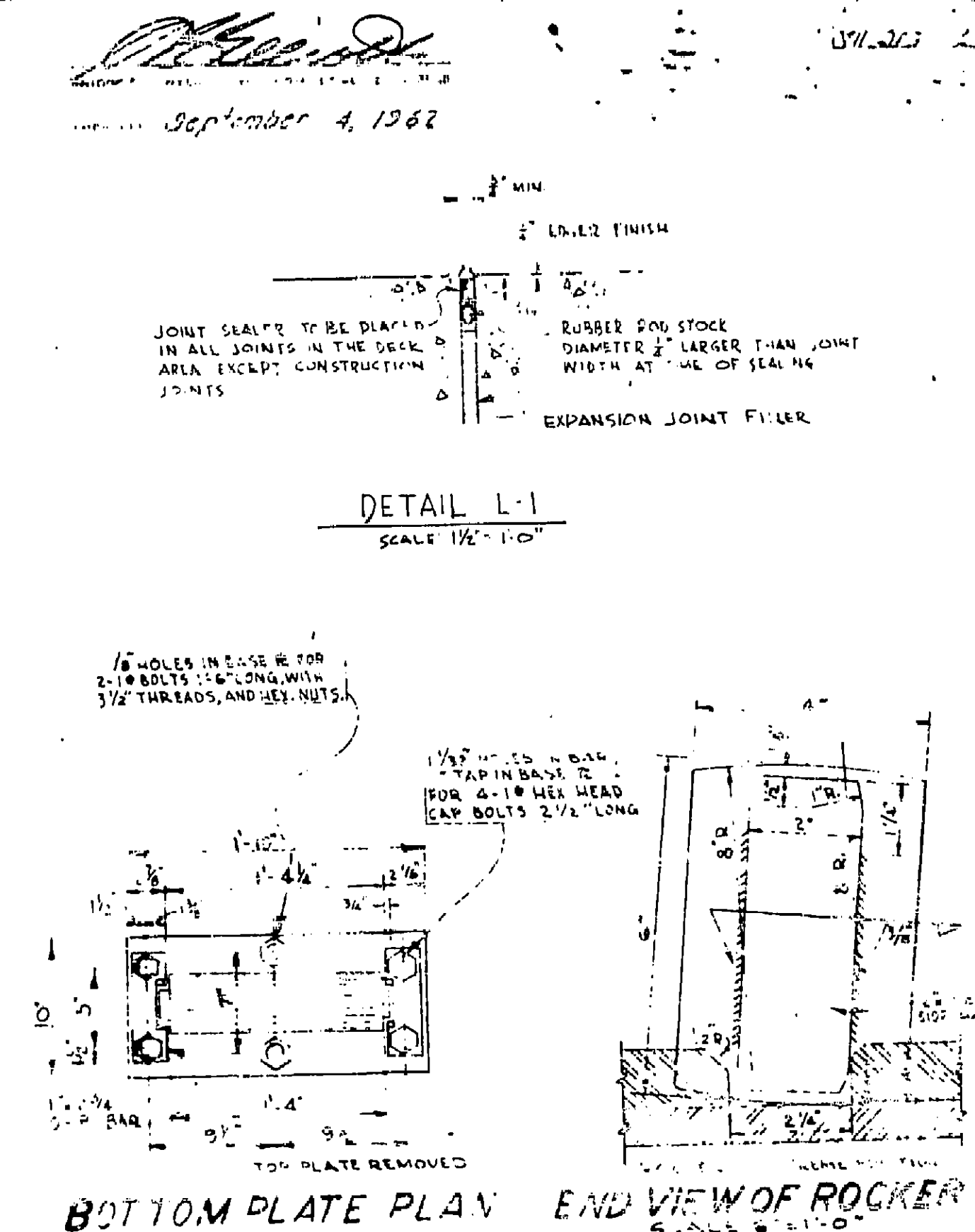


LONGITUDINAL CONSTRUCTION JOINT  
DETAIL J-4

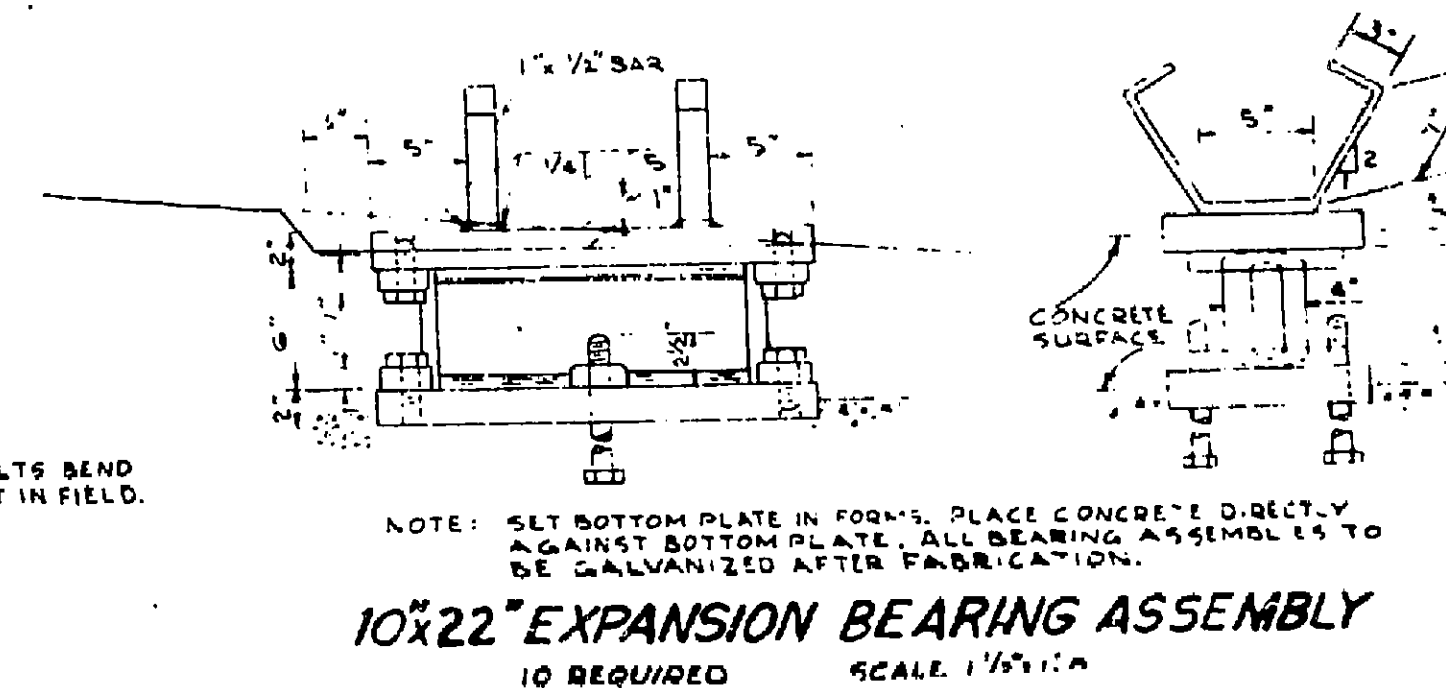


DETAIL OF ERECTION BOLTS  
SCALE: 1 1/2" = 1'-0"

INTERMEDIATE  
DIAPHRAGM SECTION  
DETAIL D-1



BOTTOM PLATE PLAN END VIEW OF ROCKER  
SCALE: 1 1/2" = 1'-0"



AS BUILT  
CORRECTIONS BY D.E. Bourgeois  
CONTRACT NO. 65-7Y24CE-P  
DATE 6/2/63

C-55638-3  
ORANGE COUNTY HIGHWAY DEPARTMENT  
SANTIAGO CANYON  
BRIDGE SC-9  
MISCELLANEOUS  
DETAILS  
BRIDGE 55C-38  
SCALE: 1 1/2" = 1'-0"

28

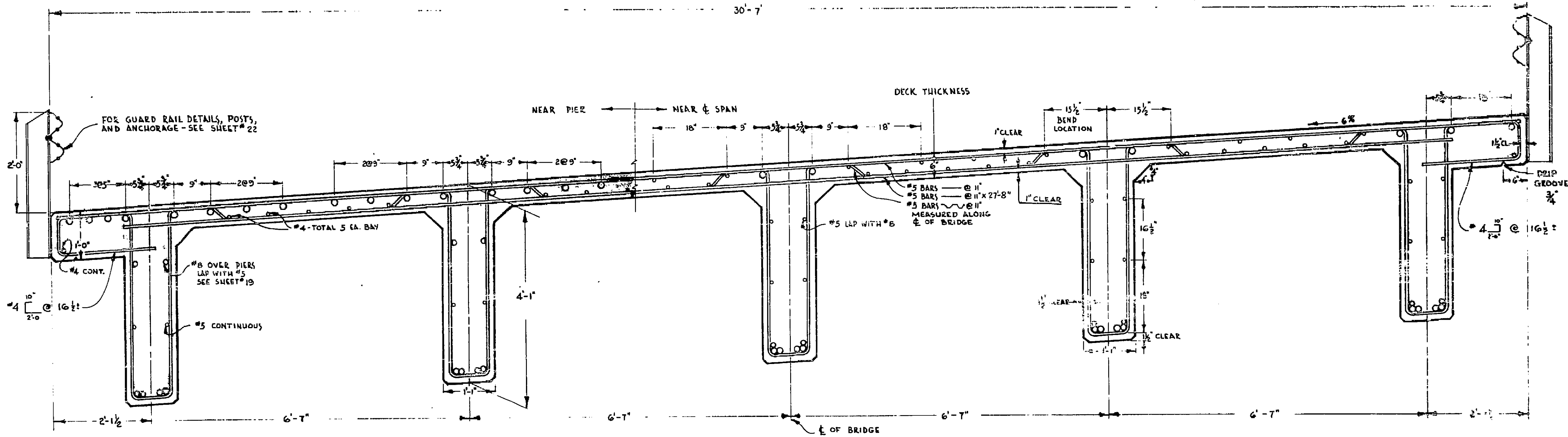




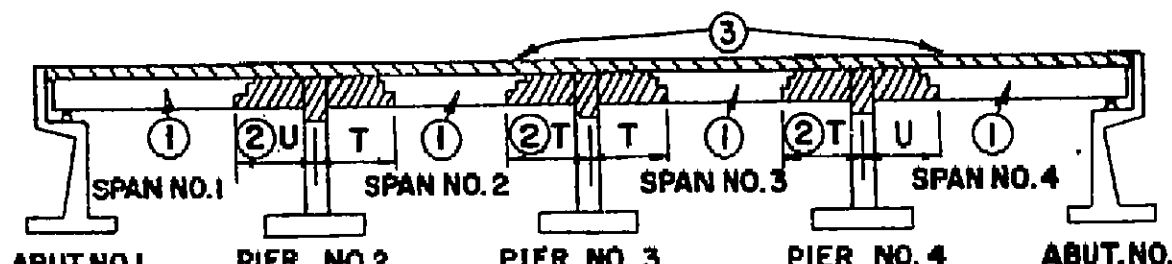


DATE 10/2/67  
 COUNTY ROAD COMMISSIONER  
 BRIDGE PLANNING ENGINEER

APPROVED September 4, 1967  
 COUNTY ROAD COMMISSIONER  
 BRIDGE PLANNING ENGINEER



TYPICAL SECTION (RADIAL)  
 SCALE 1" = 1'-0"



TEE BEAM SUPERSTRUCTURE PLACING DIAGRAM

NUMBERS (1) AND (2) INDICATE SEQUENCE OF PLACING GIRDER STEM CONCRETE  
 (2) MAY BE PLACED SIMULTANEOUSLY WITH (1) WHEN APPROVED BY THE ENGINEER, AND PROVIDED THAT THE (1) SECTIONS ARE PLACED IN ADJOINING SPANS.  
 TOP SLAB CONCRETE (3) SHALL BE PLACED SEPARATELY FROM (1) AND (2).  
 (3) MAY BE PLACED CONTINUOUSLY OR IN PARTS AS APPROVED BY THE ENGINEER, HOWEVER THE ONLY JOINTS PERMITTED SHALL BE LOCATED WITHIN 2'-0" OF THE GIRDER JOINTS BETWEEN (1) AND (2).  
 T = 1/5 SPAN LENGTH  
 U = 1/4 SPAN LENGTH  
 FOR ANY DEVIATION FROM THE ABOVE THE CONTRACTOR SHALL SUBMIT A DIAGRAM TO THE ENGINEER.

GENERAL NOTES

SPECIFICATIONS:  
 DESIGN: A.A.S.H.O. DATED 1961 WITH REVISIONS AND AS SUPPLEMENTED BY BRIDGE PLANNING AND DESIGN MANUAL.  
 CONSTRUCTION: STANDARD SPECIFICATIONS, DIVISION OF HIGHWAYS, CALIF., DATED JANUARY 1960 AND THE SPECIAL PROVISIONS.  
 LIVE LOADING: H 20-S16-44  
 UNIT STRESSES: REINFORCED CONCRETE:  $f_s = 20,000$  P.S.I.,  $n = 10$   
 $f_c = 1,200$  P.S.I.

AS BUILT  
 CORRECTIONS BY D.E. Bougeois  
 CONTRACT NO. 63-7Y2463-P  
 DATE 6/21/67

ABUT. FOOTING LOADING: EAST ABUT. - .75 TONS/S.F. WEST ABUT. - 2.0 TONS/S.F.  
 PIER FOOTING LOADING: 4.4 TONS/S.F.  
 REINFORCEMENT: EMBEDMENT IS CLEAR TO OUTSIDE OF BAR AND IS 2" TO MAIN REINFORCEMENT, EXCEPT AS NOTED. BACKING FOR HOOKS IS FOUR DIAMETERS, EXCEPT AS NOTED. WHERE REINFORCING BARS ARE SPLICED THEY SHALL HAVE A 20 DIAMETER LAP UNLESS OTHERWISE NOTED.  
 CONCRETE: CLASS "A" USING TYPE II PORTLAND CEMENT.  
 ALL EXPOSED EDGES OF CONCRETE SHALL HAVE 1" CHAMFER UNLESS OTHERWISE NOTED.

C-55C38-5  
 ORANGE COUNTY HIGHWAY DEPARTMENT  
 SANTIAGO CANYON  
 BRIDGE SC-9  
 TYPICAL SECTION  
 SCALE 1" = 1'-0" SHEET 11 OF 23

BRIDGE 55C-38

488

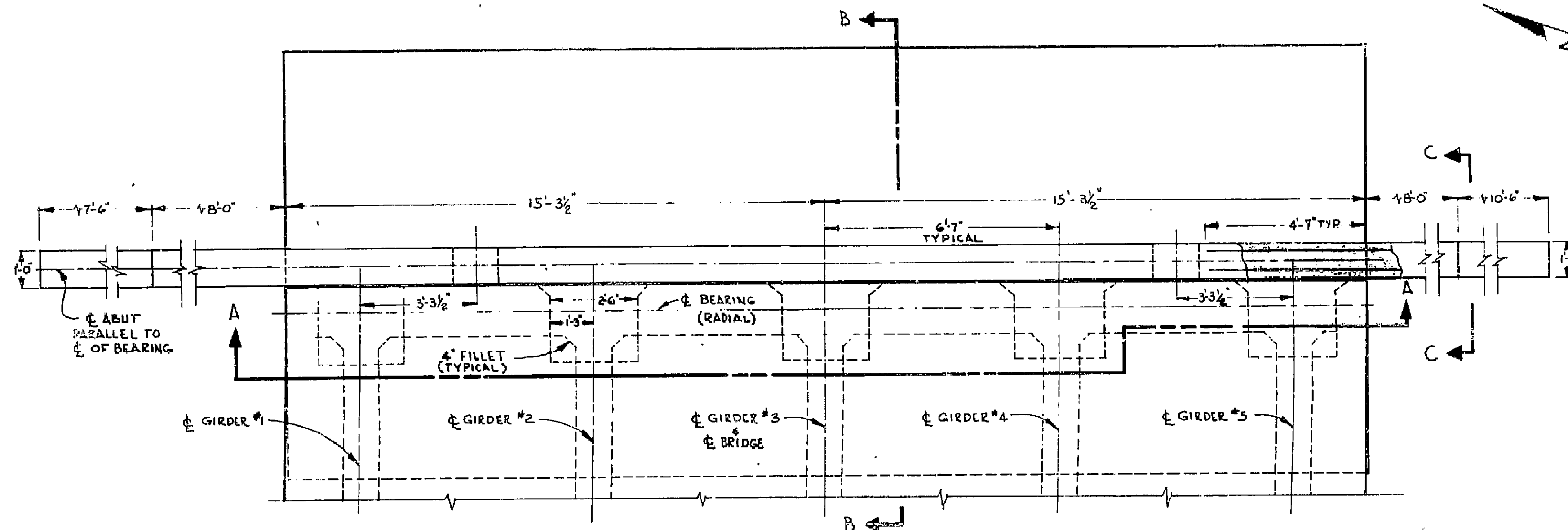
25

Structural Details  
 Checked by  
 Reviewed  
 10/2/67

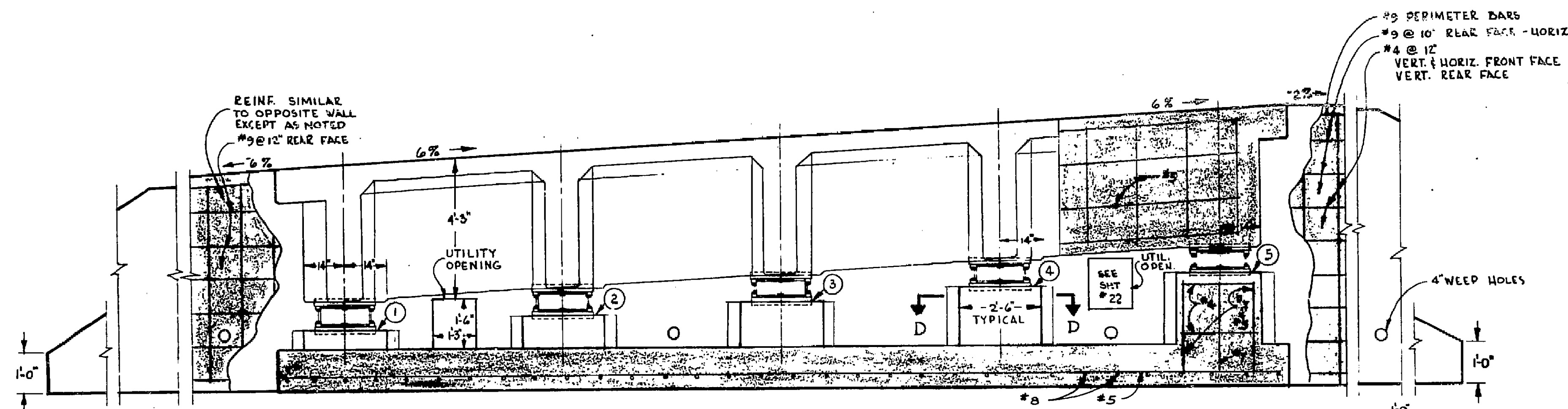


| NO. | DATE   | BY | CHKD. | APP'D. | REVISION |
|-----|--------|----|-------|--------|----------|
| 1   | 9/1/62 |    |       |        |          |

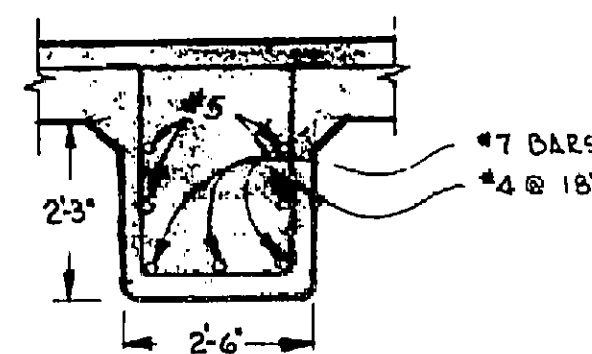
*[Signature]*  
 CIVIL ENGINEER—LICENSED  
 September 4, 1962



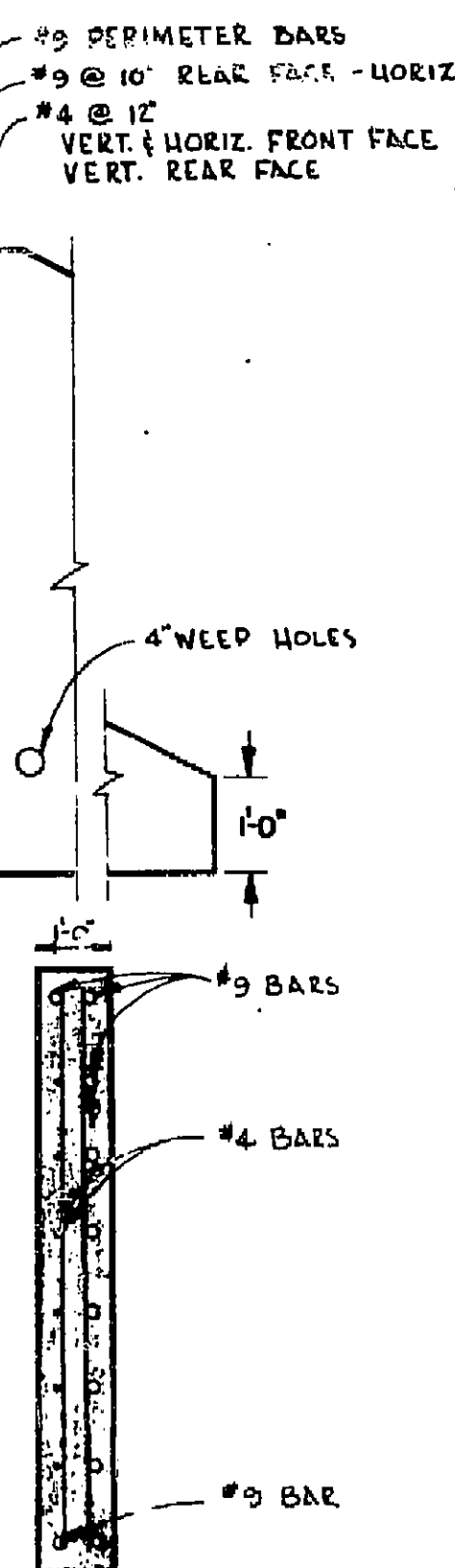
PLAN OF EAST ABUTMENT



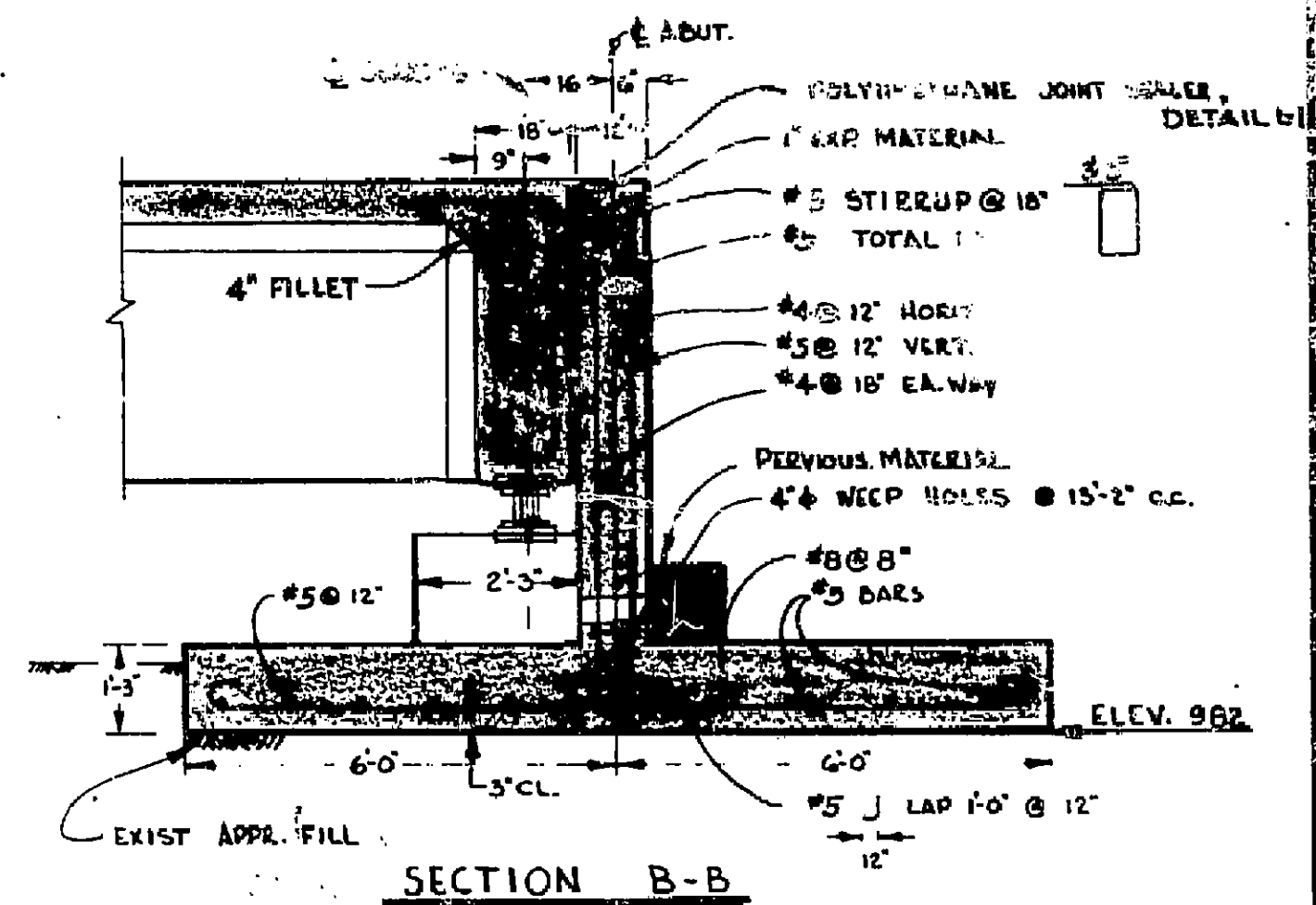
SECTION A-A



SECTION D-D



SECTION C-C



SECTION B-B

| TABLE OF ELEVATIONS |        |
|---------------------|--------|
| ①                   | 984.74 |
| ②                   | 985.14 |
| ③                   | 985.53 |
| ④                   | 985.92 |
| ⑤                   | 986.32 |

Structural Details  
 Checked by *[Signature]*  
 Revised *[Signature]*  
 Approval *[Signature]*

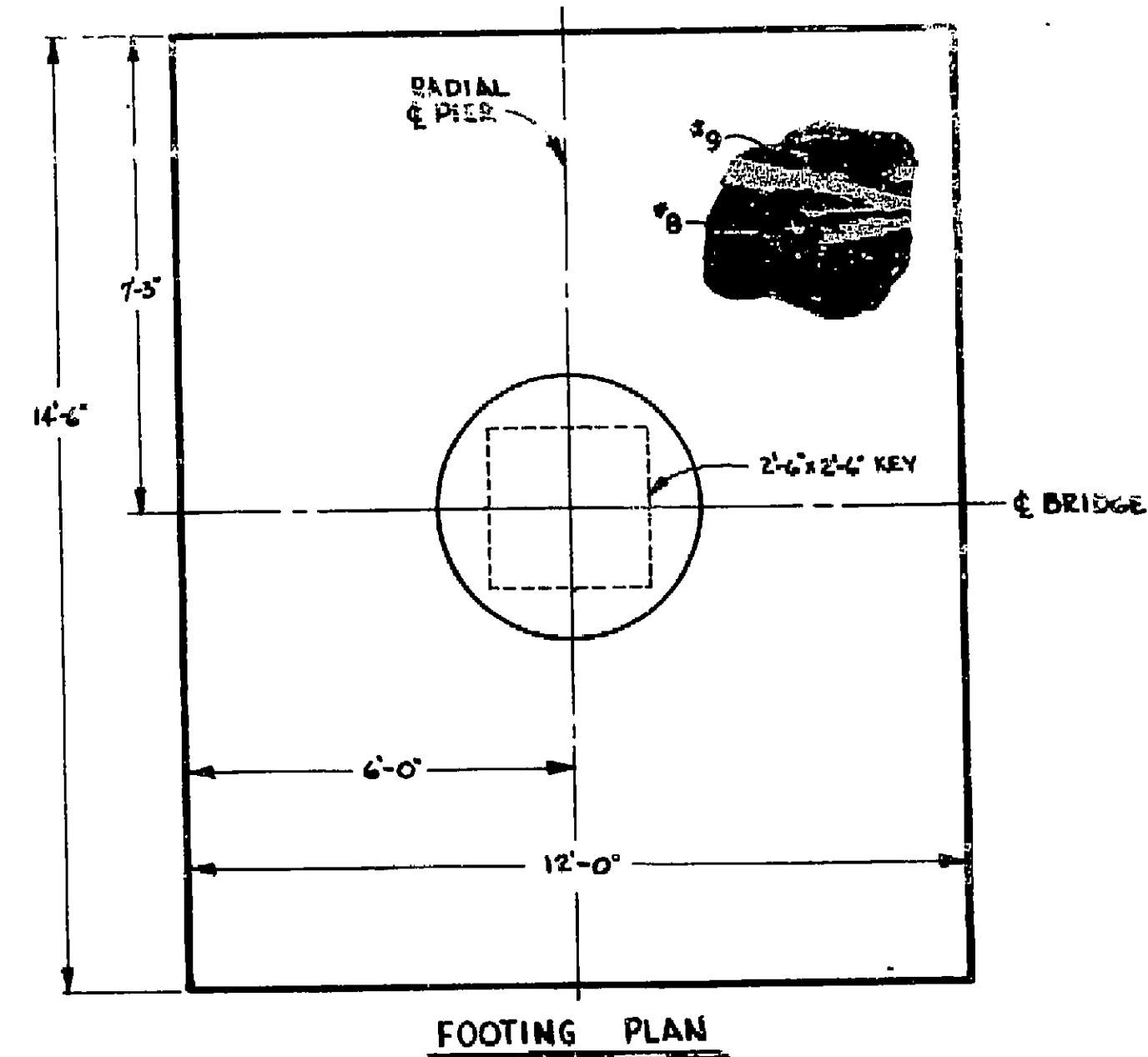
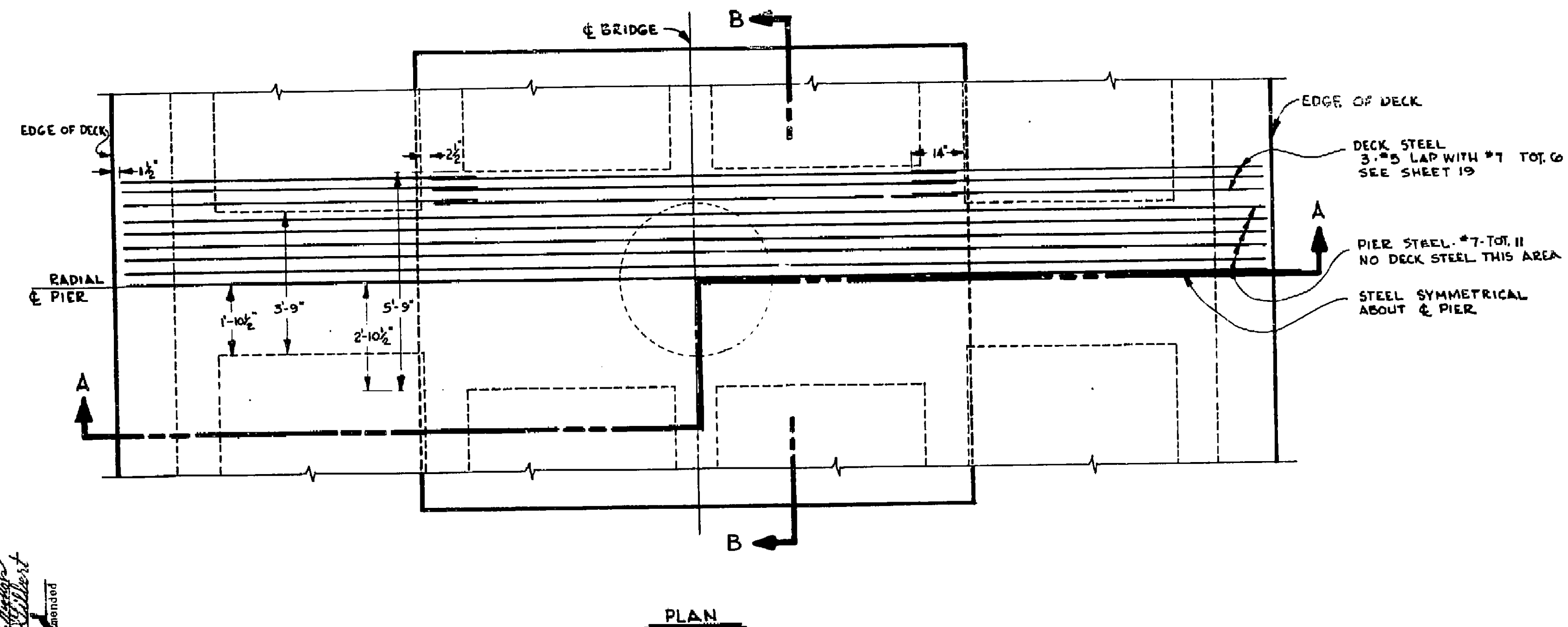
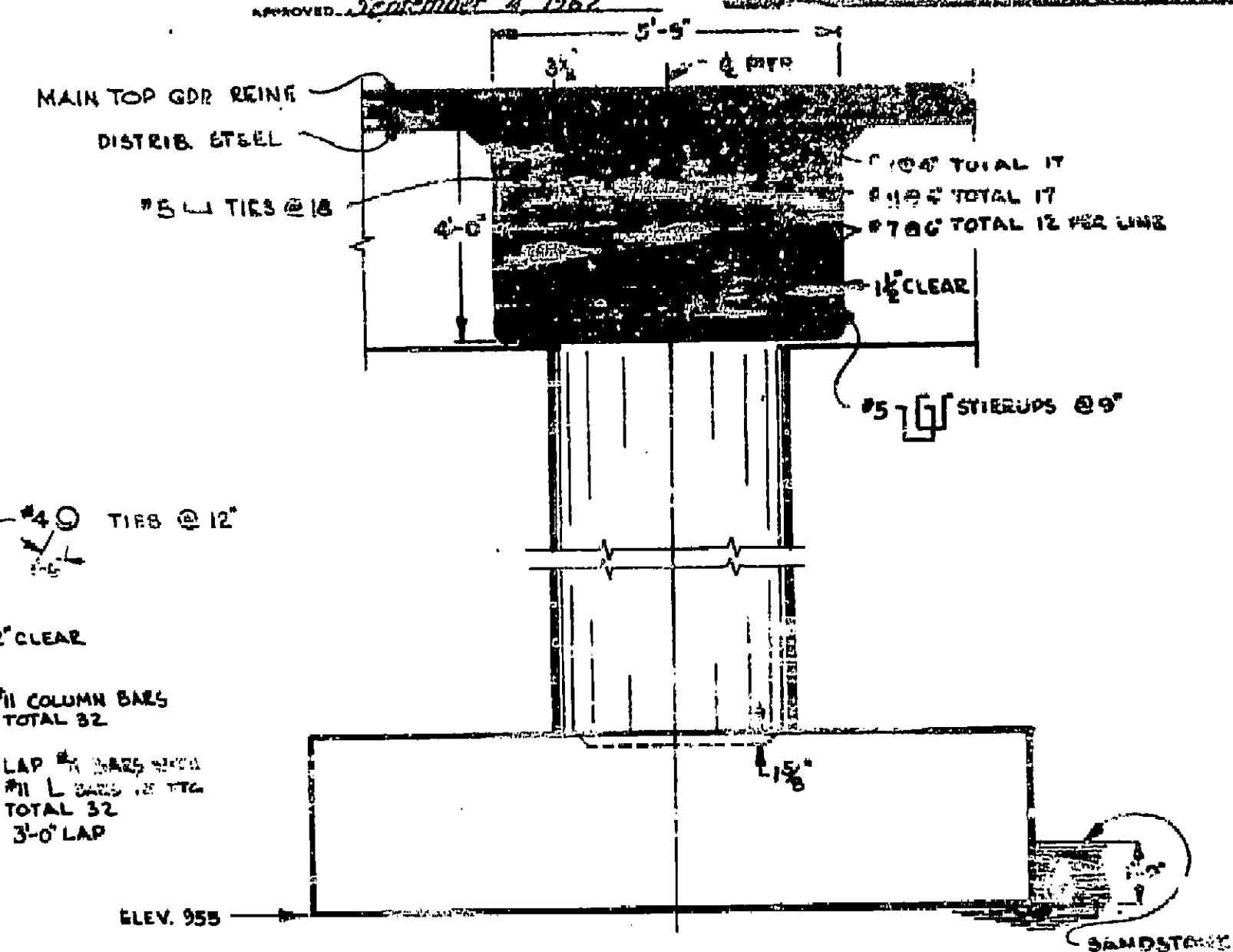
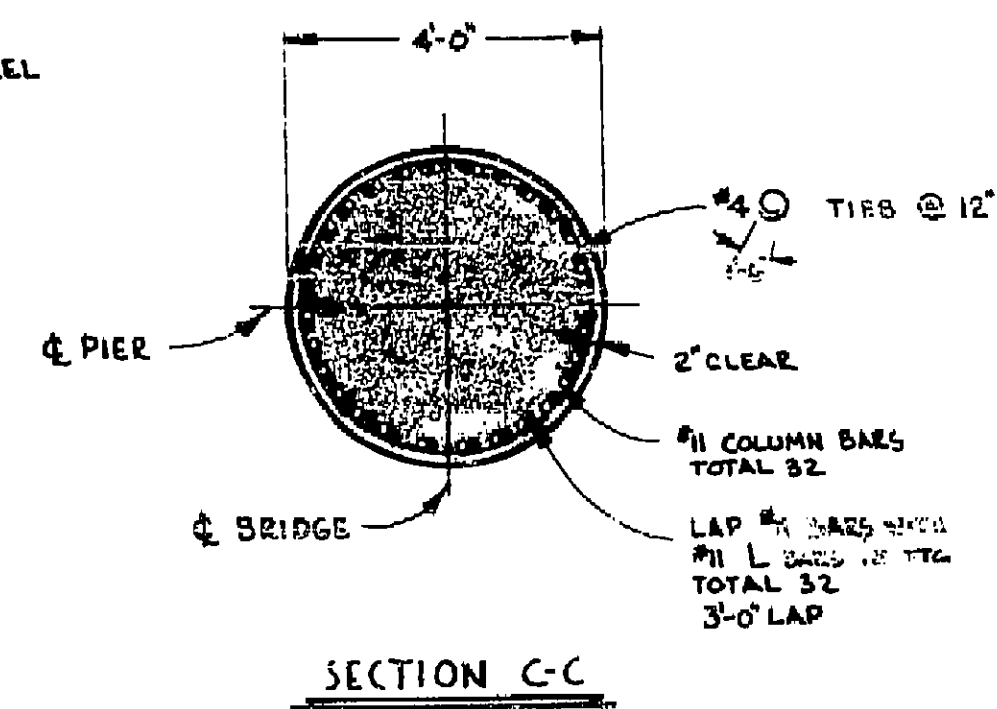
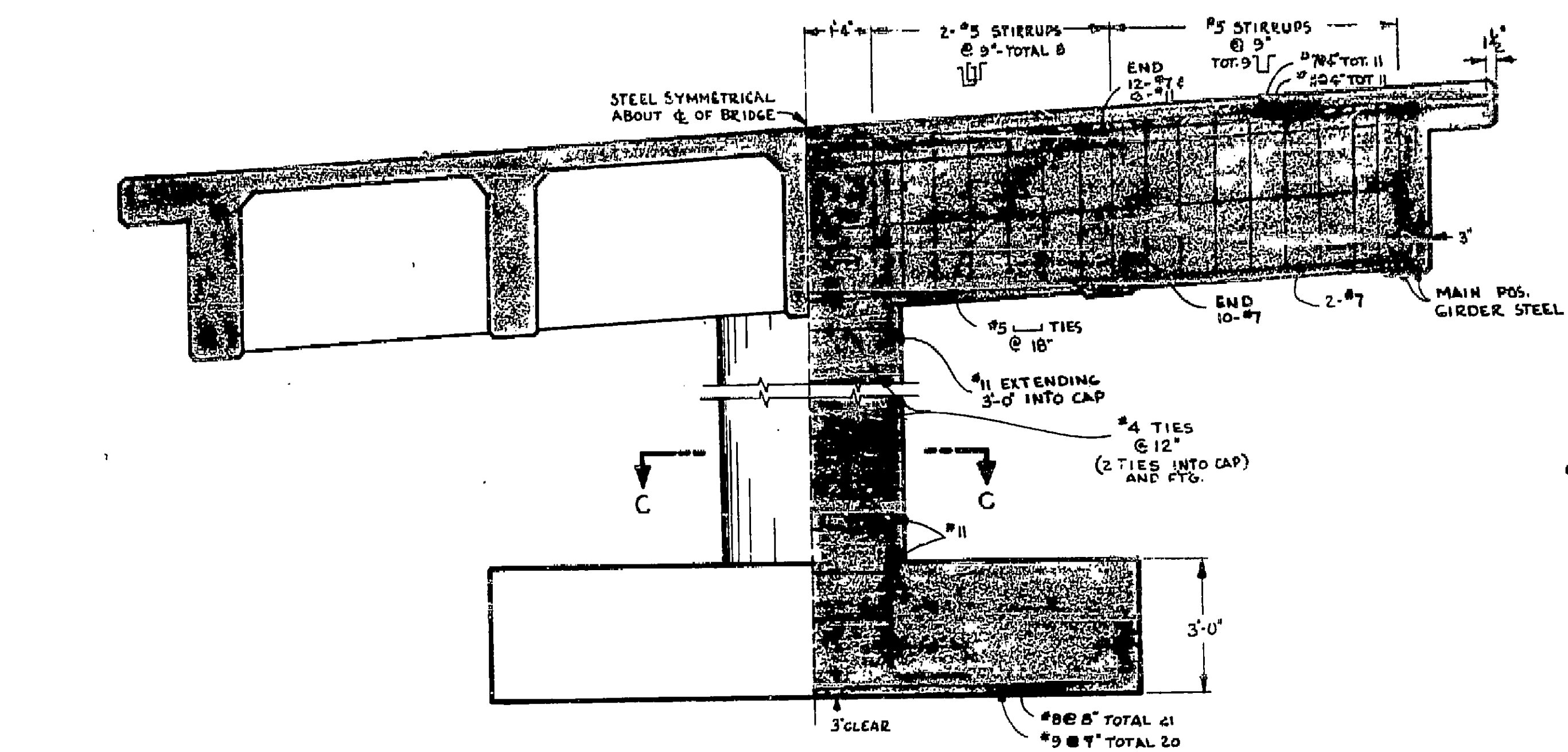
**AS BUILT**  
 CORRECTIONS BY *D.E. Bourgoin*  
 CONTRACT NO. 63-TY2463-P  
 DATE 6/21/63

|                                  |               |
|----------------------------------|---------------|
| G-55C38-4                        |               |
| ORANGE COUNTY HIGHWAY DEPARTMENT |               |
| SANTIAGO CANYON                  |               |
| BRIDGE SC-9                      |               |
| ABUTMENT                         |               |
| DETAIL - EAST                    |               |
| SCALE 1/4" = 1'-0"               | SHEET 1 OF 20 |

BRIDGE 55C-98

487





AS BUILT  
CORRECTIONS BY *E. Bancroft*  
CONTRACT NO. *65-7Y24C-P*  
DATE *6/21/65*

6-55630-2

ORANGE COUNTY HIGHWAY DEPARTMENT

SANTIAGO CANYON  
BRIDGE SC-9

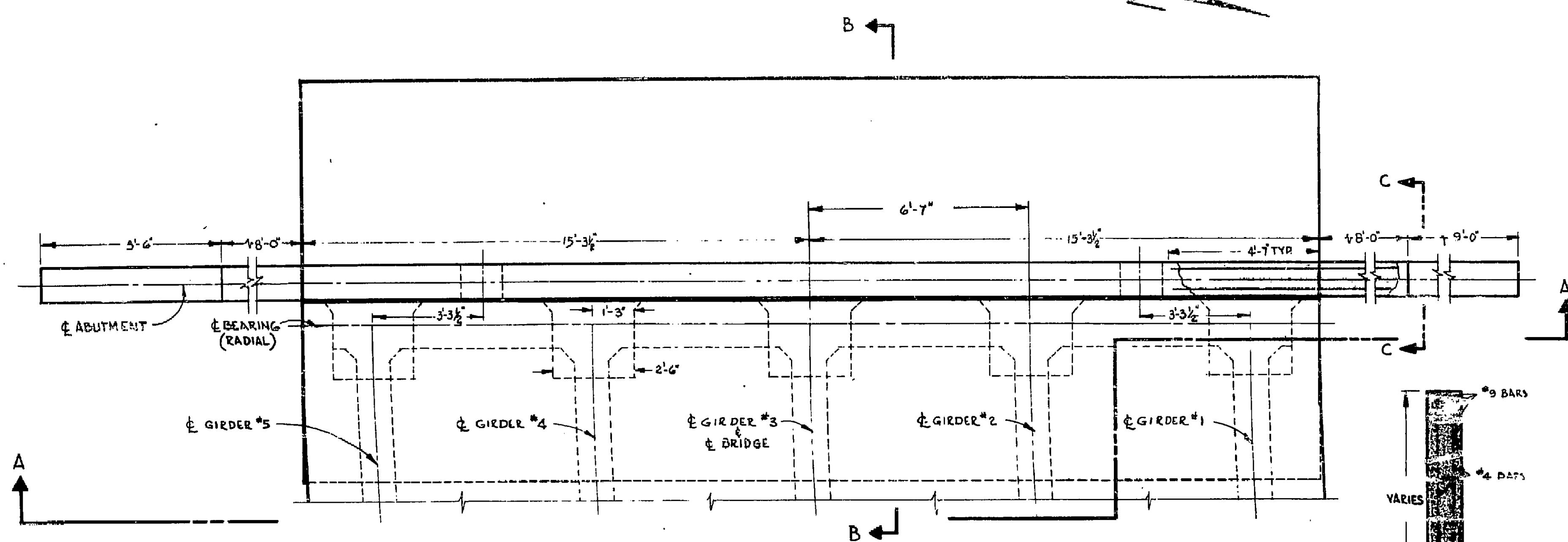
PIER DETAIL

SCALE 1"=1'-0"

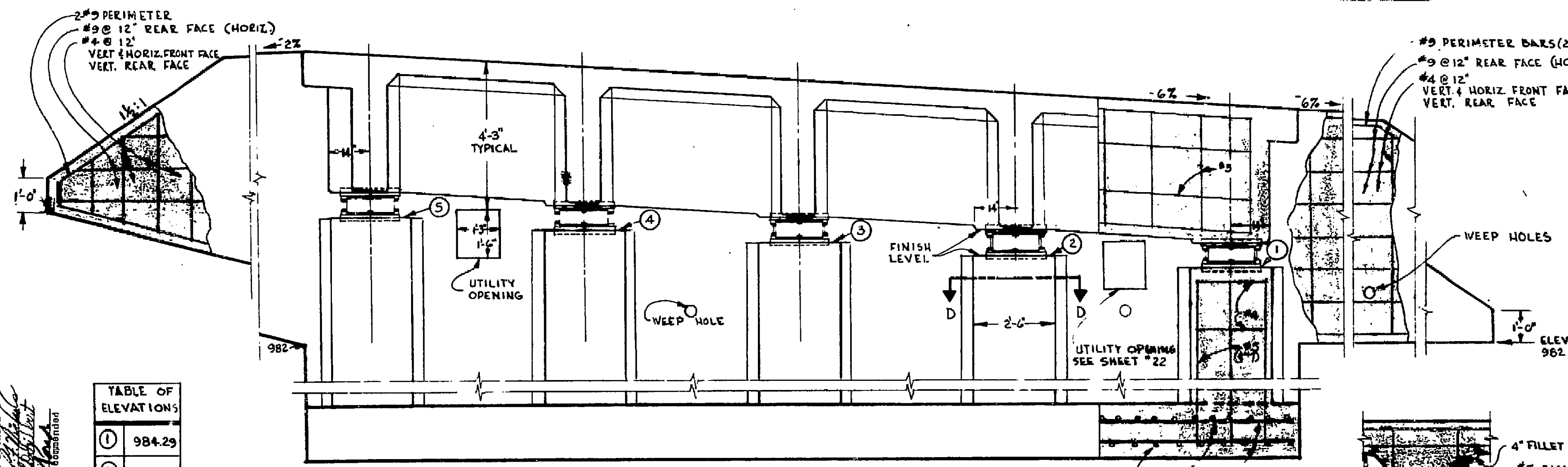
SHEET 18 OF 24



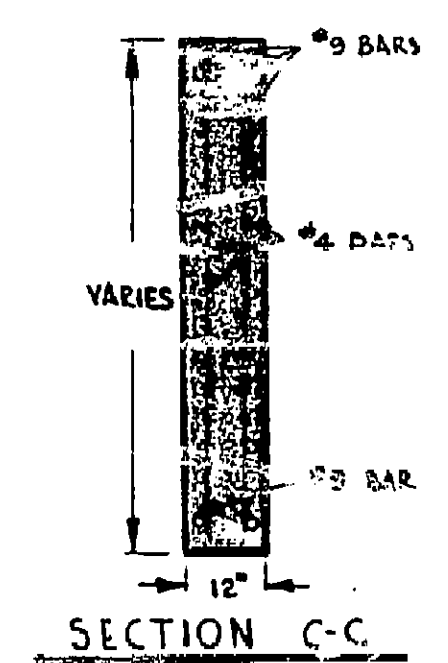
*September 4, 1967*



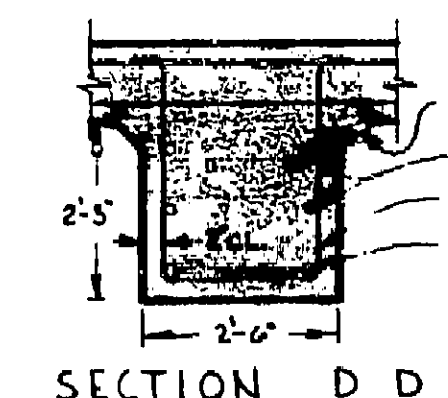
PLAN OF WEST ABUTMENT



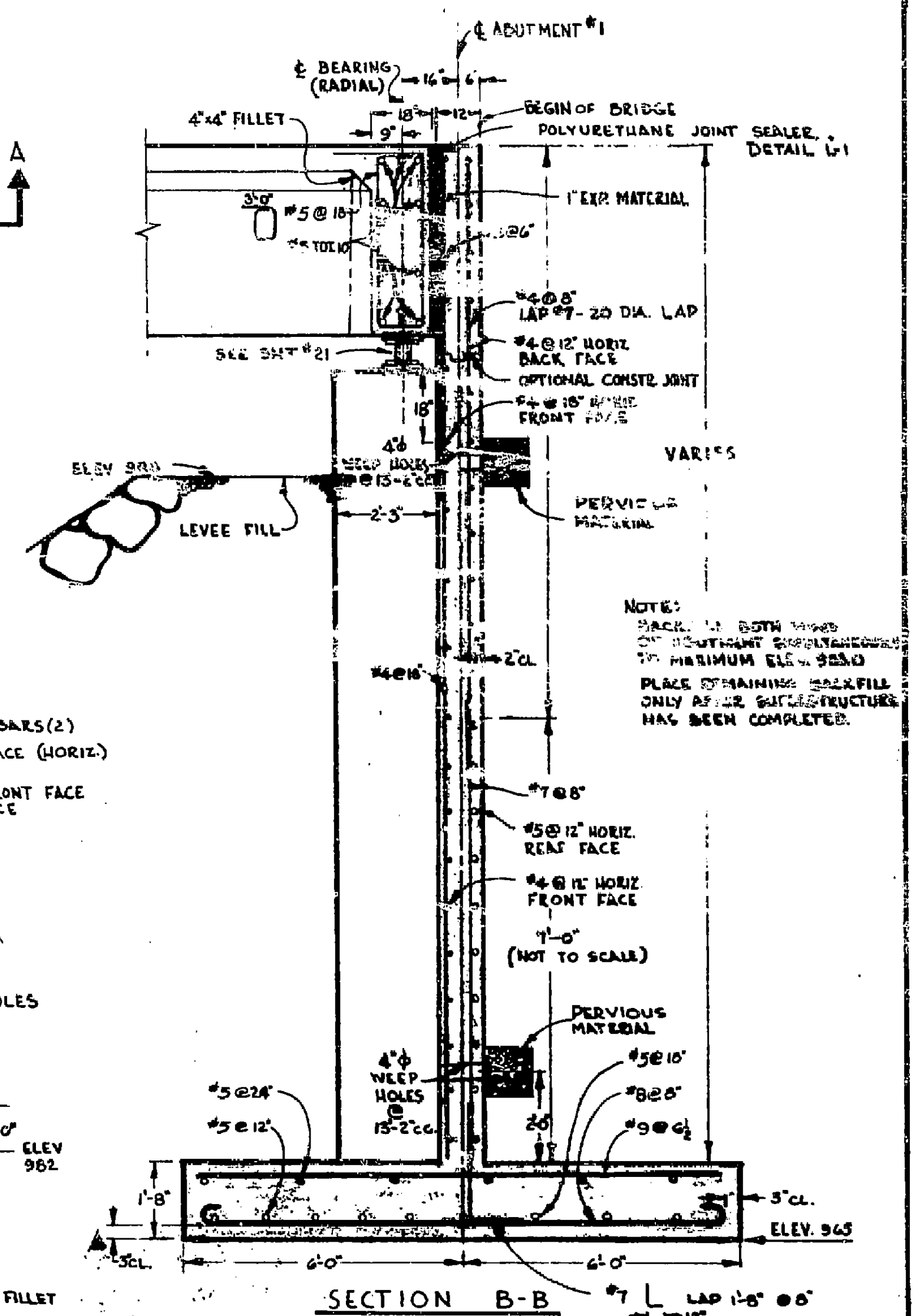
SECTION A-A



SECTION C-C



SECTION D-D



SECTION B-B

NOTE:  
 BACK OF BOTH WINGS  
 OF ABUTMENT DISCONTINUED  
 TO MINIMUM ELEV. 955.0  
 PLACE REMAINING BACK FILL  
 ONLY AFTER OUTLETS/STRUCTURE  
 HAS BEEN COMPLETED.

| TABLE OF ELEVATIONS |        |
|---------------------|--------|
| ①                   | 984.29 |
| ②                   | 984.68 |
| ③                   | 985.07 |
| ④                   | 985.46 |
| ⑤                   | 985.85 |

**AS BUILT**  
 CORRECTIONS BY D.E. BOURGEOIS  
 CONTRACT NO. 67-TY2463-P  
 DATE 6/21/87

ORANGE COUNTY HIGHWAY DEPARTMENT  
 SANTIAGO CANYON  
 BRIDGE SC-9  
 ABUTMENT  
 DETAIL - WEST  
 SCALE 1/2" = 1'-0"