

**CITY OF**  
**RIVERSIDE, CALIFORNIA**  
**SANTA ANA OUTFALL**

**1957**

**INDEX**

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	KEY MAP AND LEGEND
3	PLAN & PROFILE ~ STA. 1+22.8 TO STA. 27+00
4	PLAN & PROFILE ~ STA. 27+00 TO STA. 54+00
5	PLAN & PROFILE ~ STA. 54+00 TO STA. 81+00
6	PLAN & PROFILE ~ STA. 81+00 TO STA. 108+00
7	PLAN & PROFILE ~ STA. 108+00 TO STA. 135+00
8	PLAN & PROFILE ~ STA. 135+00 TO STA. 162+50
9	PLAN & PROFILE ~ STA. 162+50 TO STA. 189+50
10	PLAN & PROFILE ~ STA. 189+50 TO STA. 197+99.8
11	DETAILS OF SEWER JUNCTION MANHOLES
12	DRAINAGE STRUCTURES
13	DRAINAGE STRUCTURES
14	MANHOLE DETAILS
15	MISCELLANEOUS DETAILS

MAYOR

EDWARD V. DALES

COUNCIL MEMBERS

JOHN H. BACKSTRAND	JOHN B. BERGIN
WILLIAM H. BONNETT	CHARLES H. JOHNSON
NANCY C. O'NEILL	JAMES A. SMUTZ

ULRICH L. VORIS

CITY MANAGER

TED B. ADSIT

DIRECTOR OF PUBLIC WORKS  
AND CITY ENGINEER

JAMES F. MARTINEK

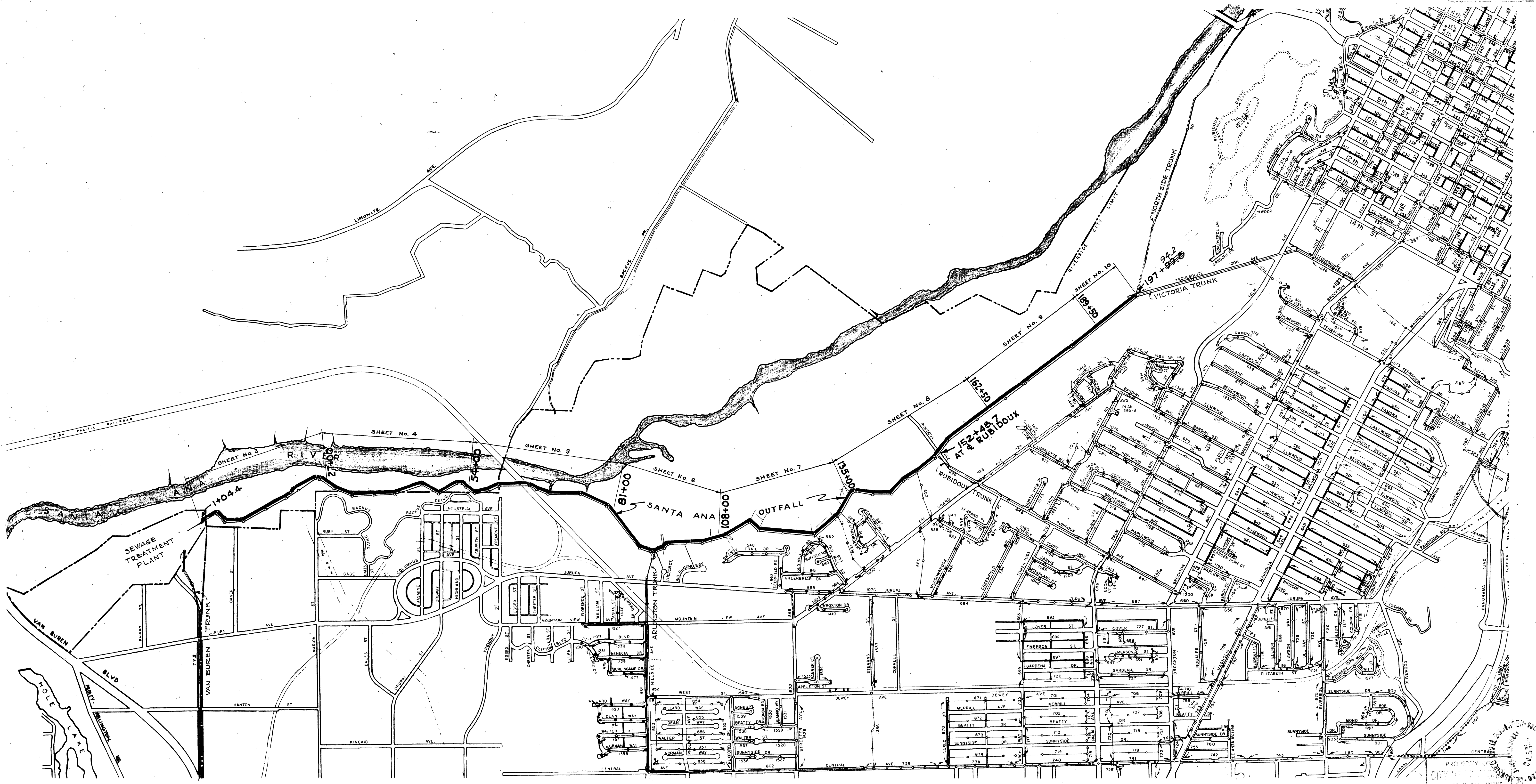
ASST. CITY ENGINEER  
FRANK F. LEFEBER

CITY ATTORNEY  
ALBERT H. FORD

JOHN A. CAROLLO  
CONSULTING ENGINEERS  
PHOENIX ARIZONA

CITY OF RIVERSIDE, CALIFORNIA, JULY 1957



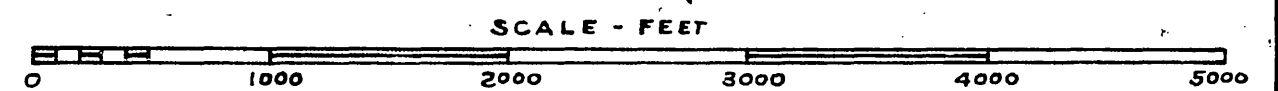


— LEGEND —

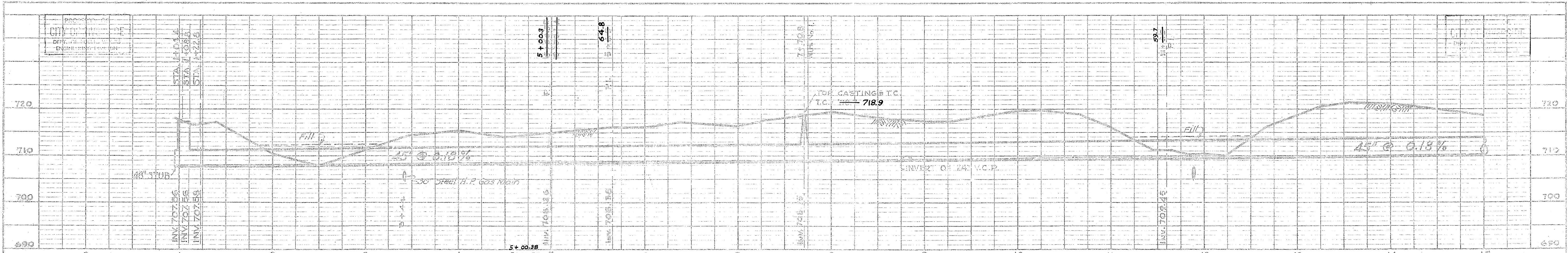
- — — — — EXISTING SAN. SEWER
- — — — — SANTA ANA OUTFALL
- — — — — — MANHOLE ON SANTA ANA OUTFALL
- — — — — POWER LINE
- — — — — FENCE LINE
- — — — — CENTER LINE
- — — — — STORM SEWER
- — — — — PROPERTY LINE
- — — — — — TREE OR BUSH - SIZE NOTED

AS BUILT, JULY 1959

REVISIONS			JOHN A. CAROLLO CONSULTING ENGINEERS PHOENIX, ARIZONA	
MARK	DATE	DESCRIPTION	CITY OF RIVERSIDE, CALIFORNIA DEPARTMENT OF PUBLIC WORKS	
			<p><b>SANTA ANA OUTFALL KEY MAP &amp; LEGEND</b></p>	
DESIGNED BY G.C.V.		CHECKED BY G.C.W.	<p>APPROVED BY <i>[Signature]</i> DIRECTOR OF PUBLIC WORKS 7/30/57</p>	
DRAWN BY R.D.L.		RECOMMENDED BY <i>[Signature]</i> ASSISTANT CITY ENGINEER		



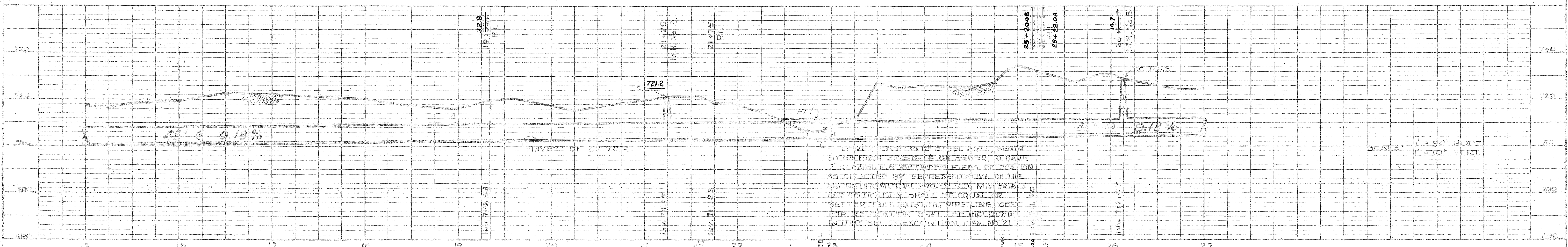




BM: At treatment plant  
Nail in lead, easterly  
corner of conc. junction  
box at west end of north-  
ly sedimentation units.  
Elev. 709.67

NOTE TO CONTRACTOR:  
SOUTHERN COUNTIES GAS CO.  
OF CALIFORNIA, P.O. BOX 757  
INDIO, CALIF. SHALL BE NOTIFIED  
IN ADVANCE OF ANY EXCAVATION  
ADJACENT TO THE 30" STEEL  
HI-PRESSURE GAS MAIN  
CROSSING AT STA. 3+44

BM: "X" on rim of C.I. frame  
on existing M.H. 12' R.I.  
Sta. 7+70.8 - Elev. 721.25



BM: Near side of rim of C.I. frame  
on Existing M.H. 12' R.I. Sta. 19+33.4  
Elev. 724.65

UNLESS OTHERWISE SPECIFIED, ALL  
PIPE SHALL BE 12" MIN. DIAMETER  
AND SHALL BE SET IN 6" MIN. SAND  
OR OTHER SUFFICIENTLY FINE MATERIAL  
TO BE COMPACTED TO A MINIMUM  
DENSITY OF 95% OF THE THEORETICAL  
DENSITY AS DETERMINED BY THE  
STANDARD PENNY TEST. ALL MATERIALS  
FOR RELOCATION SHALL BE EQUAL OR  
BETTER THAN EXISTING PIPE. THE  
RELOCATION SHALL BE IN ACCORDANCE  
WITH THE EXISTING RECORD DRAWINGS  
IN THE CASE OF EXCAVATION, ITEM NO. 21

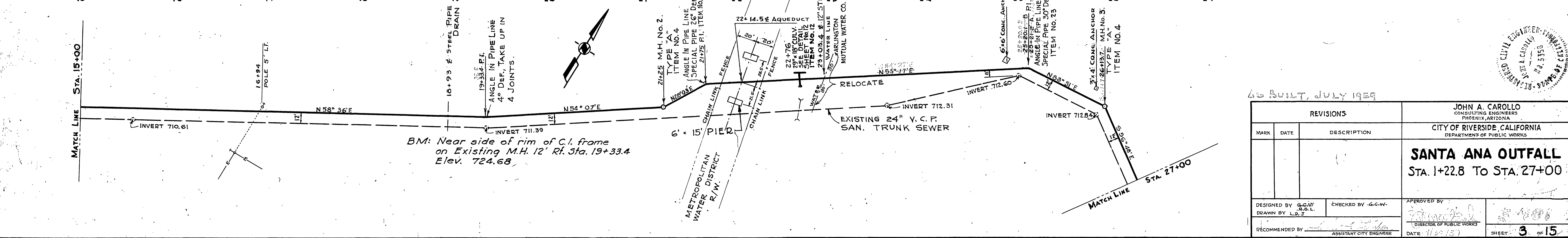
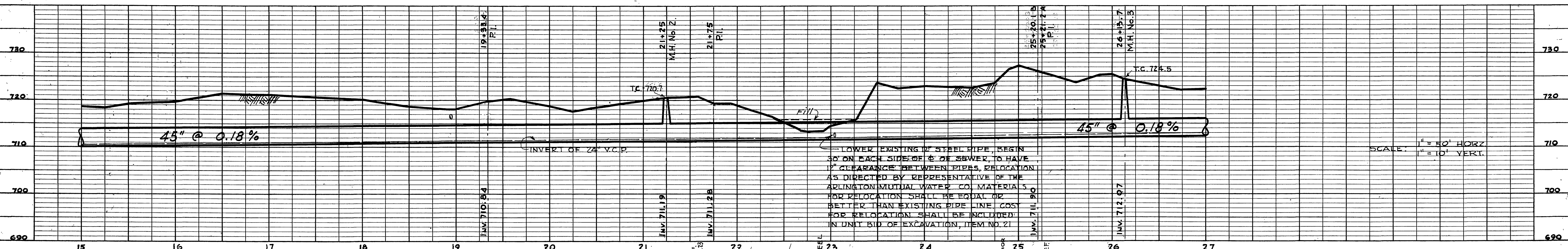
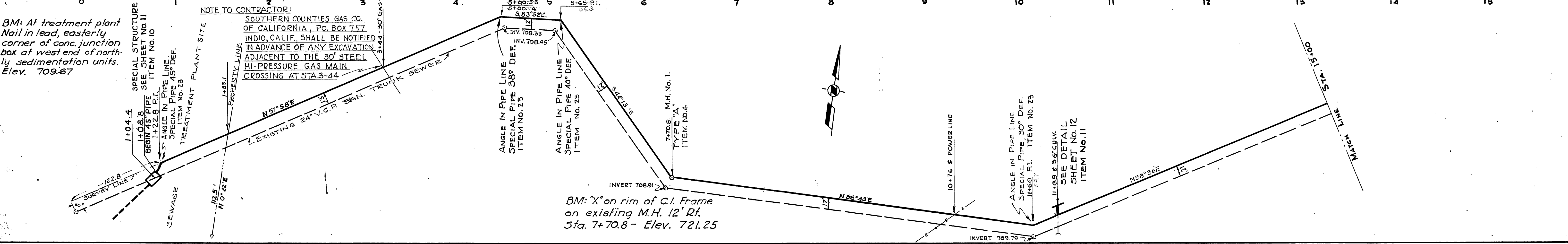
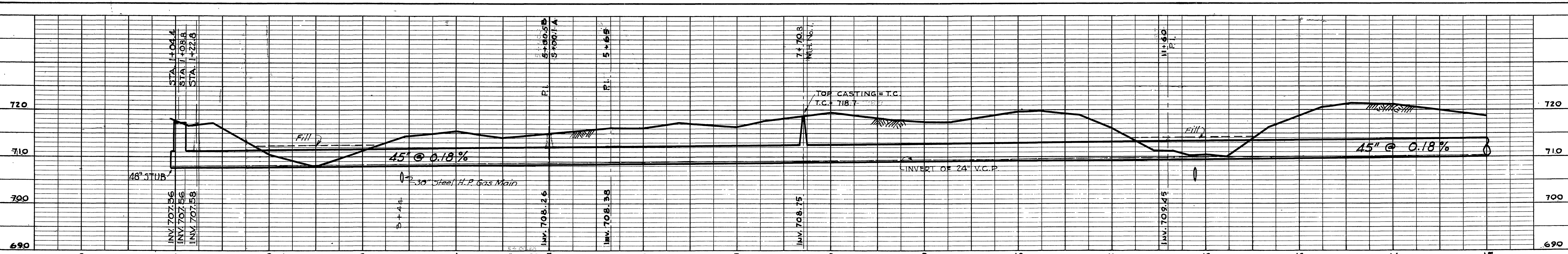
SCALE: 1" = 20' HORIZ.  
1" = 10' VERT.

PROPERTY OF  
CITY OF RIVERSIDE  
DEPT. OF PUBLIC WORKS  
ENGINEERING DIVISION

AS BUILT, JULY 1959

REVISIONS			JOHN A. CAROLLO CONSULTING ENGINEER PHOENIX, ARIZONA CITY OF RIVERSIDE, CALIFORNIA DEPARTMENT OF PUBLIC WORKS
MARK	DATE	DESCRIPTION	
			SANTA ANA OUTFALL STA. 1+22.8 TO STA. 27+00
DESIGNED BY	G.C.W.	CHECKED BY	APPROVED BY  DATE: 9/30/57
DRAWN BY	L.S.		
RECOMMENDED BY	Charles J. Lofgren		SHEET 5 OF 15 410-B-1006





SCALE: 1" = 30' HORIZ.  
 1" = 10' VERT.

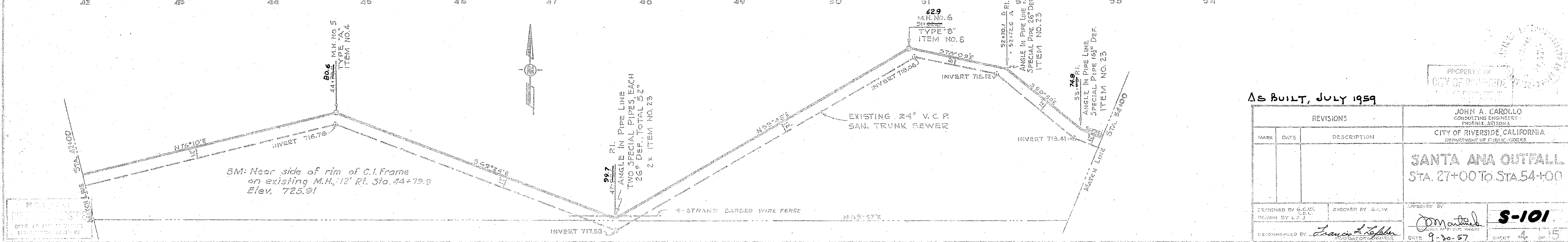
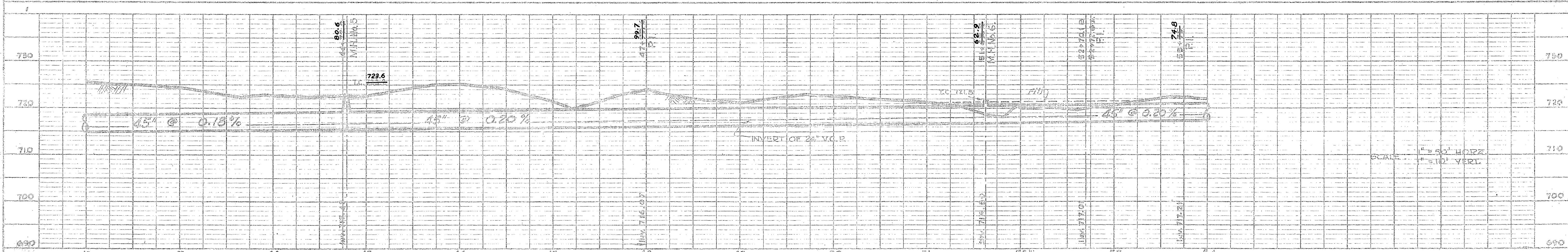
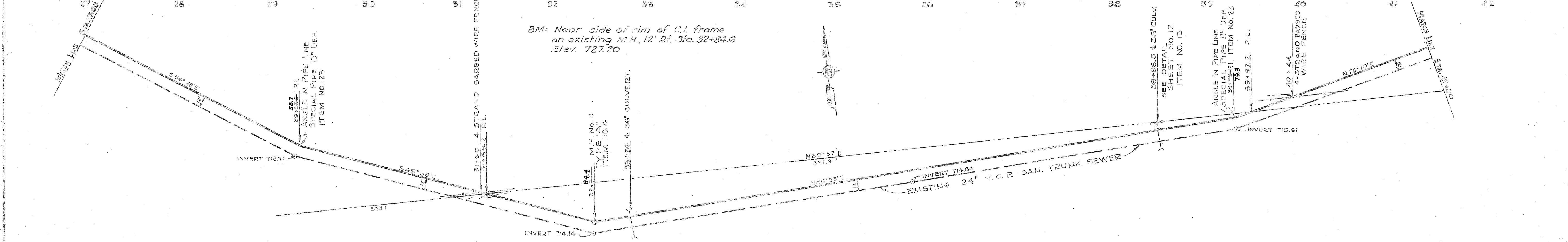
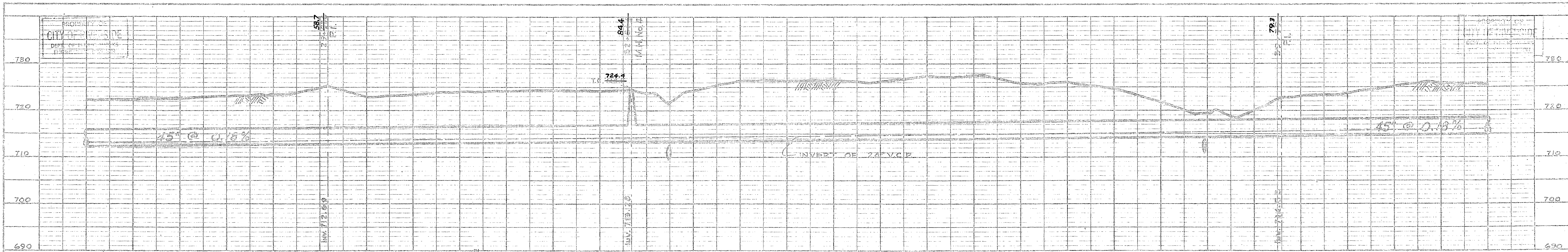
BUILT JULY 1929

REVISIONS		
MARK	DATE	DESCRIPTION

DESIGNED BY G.C.W.  
 DRAWN BY L.B.J.  
 CHECKED BY G.C.W.  
 APPROVED BY [Signature]  
 DIRECTOR OF PUBLIC WORKS  
 DATE: 11-22-15

JOHN A. CAROLLO  
 CONSULTING ENGINEERS  
 PHOENIX, ARIZONA  
 CITY OF RIVERSIDE, CALIFORNIA  
 DEPARTMENT OF PUBLIC WORKS  
**SANTA ANA OUTFALL**  
 STA. 1+22.8 TO STA. 27+00





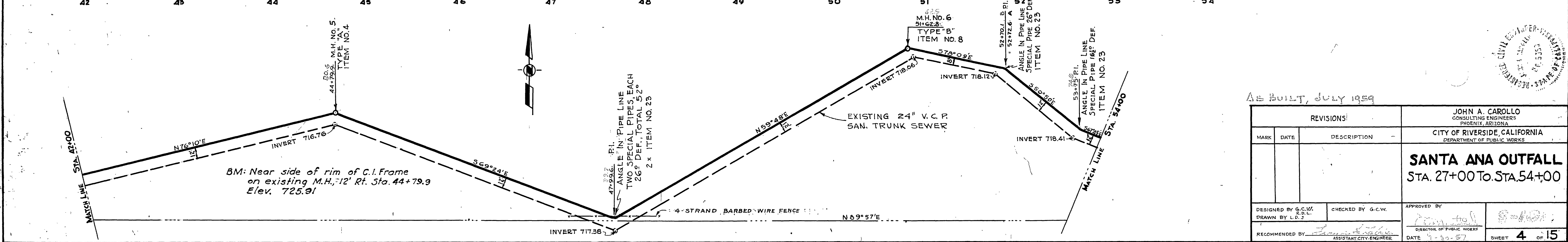
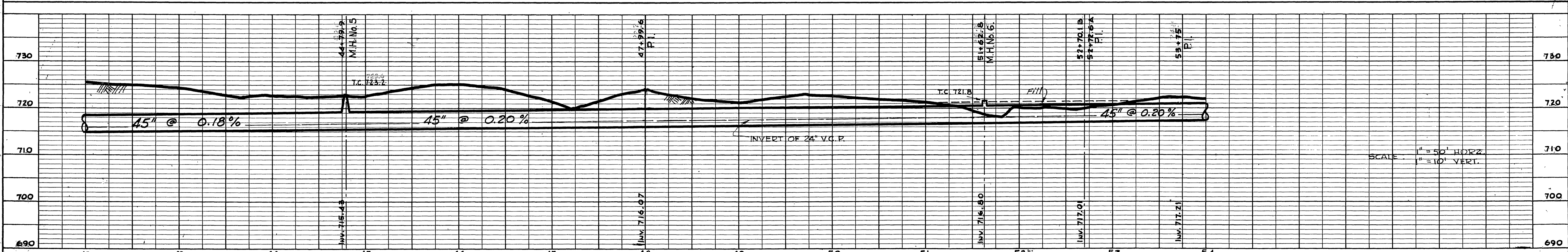
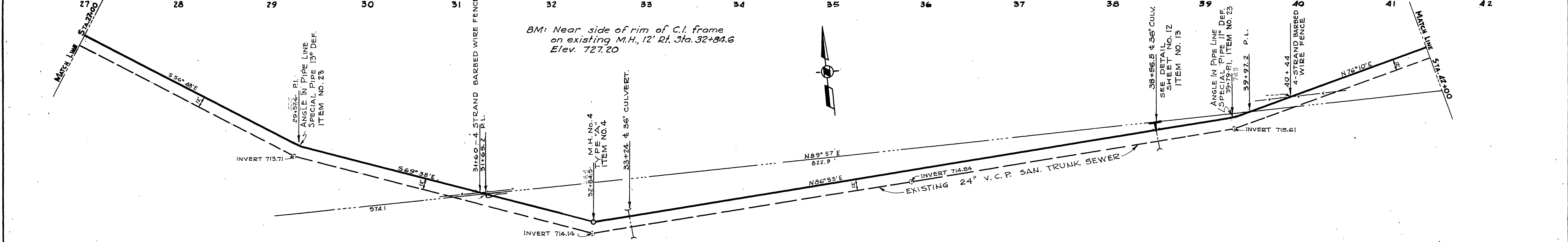
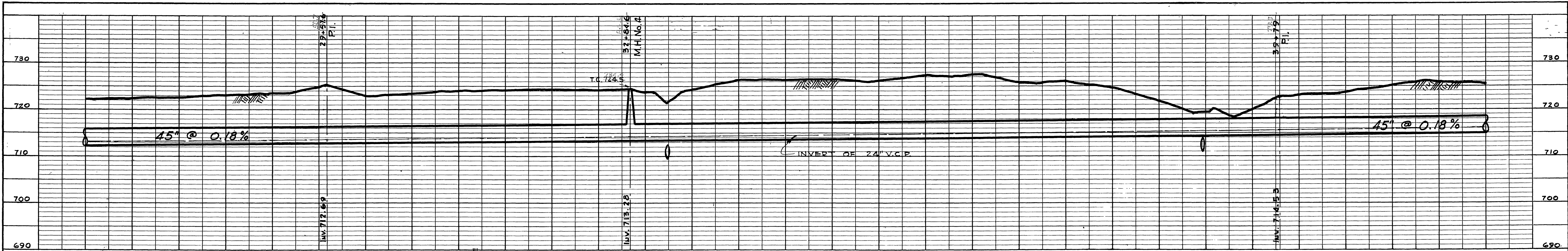
AS BUILT, JULY 1959

REVISIONS			JOHN A. CAROLLO CONSULTING ENGINEER PROBABLY ASSISTANT CITY OF RIVERSIDE, CALIFORNIA DEPARTMENT OF PUBLIC WORKS
MARK	DATE	DESCRIPTION	
			CITY OF RIVERSIDE, CALIFORNIA DEPARTMENT OF PUBLIC WORKS <b>SANTA ANA OUTFALL</b> STA. 27+00 TO STA. 54+00

DESIGNED BY G.C.W.    DRAWN BY L.D.S.    CHECKED BY G.C.W.    APPROVED BY *Francis J. Lippe*    DATE 9-30-57    SHEET 4 OF 15

417-5-1096





AS BUILT, JULY 1959

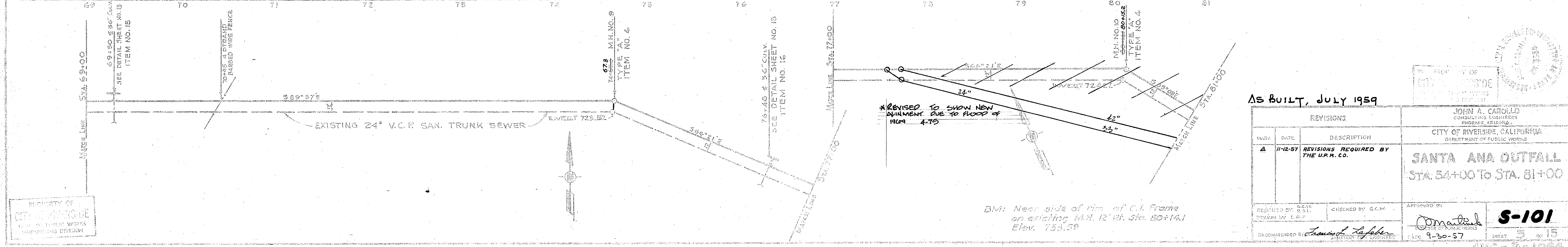
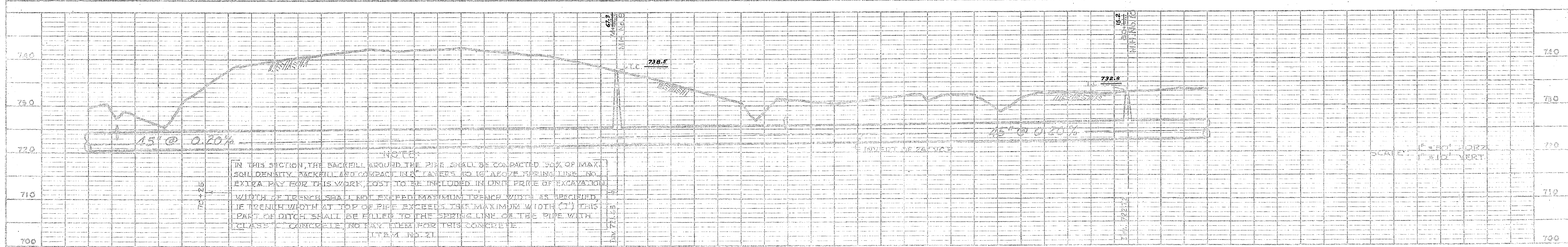
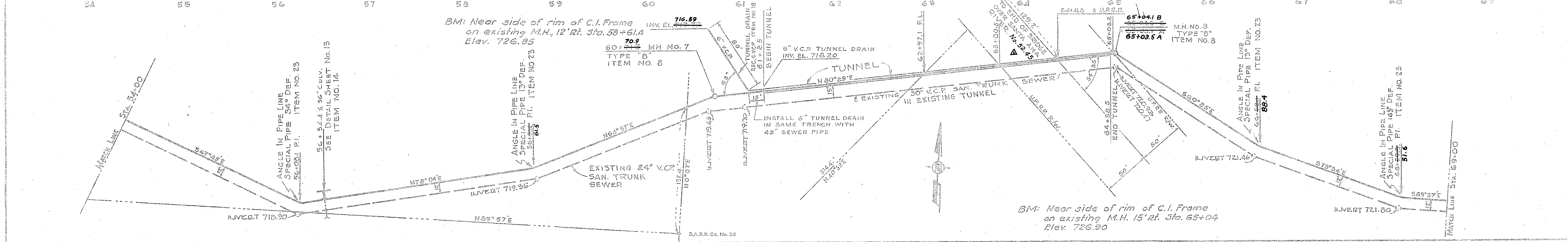
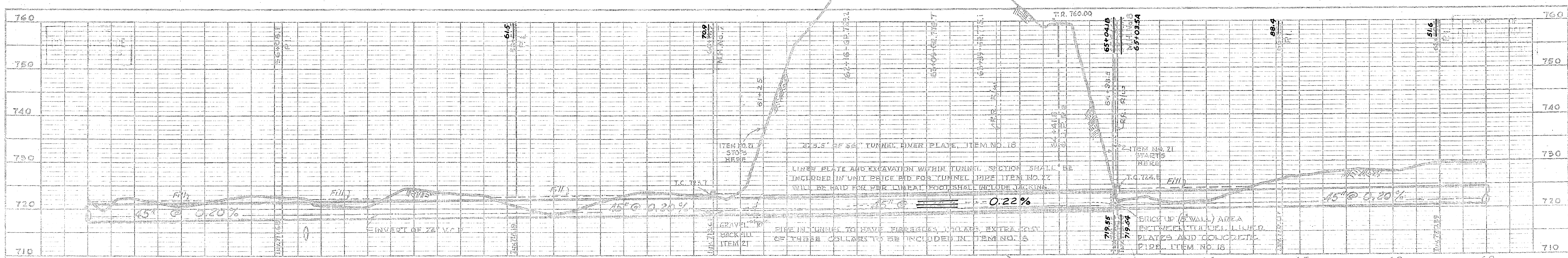
REVISIONS		DESIGNED BY G.C.W. DRAWN BY L.D.J.		CHECKED BY G.C.W.		APPROVED BY <i>[Signature]</i> DIRECTOR OF PUBLIC WORKS	
MARK	DATE	DESCRIPTION					

JOHN A. CAROLLO  
CONSULTING ENGINEERS  
PHOENIX, ARIZONA  
CITY OF RIVERSIDE, CALIFORNIA  
DEPARTMENT OF PUBLIC WORKS

**SANTA ANA OUTFALL**  
STA. 27+00 TO STA. 54+00

RECOMMENDED BY *[Signature]* ASSISTANT CITY ENGINEER DATE 7-20-57 SHEET 4 OF 15



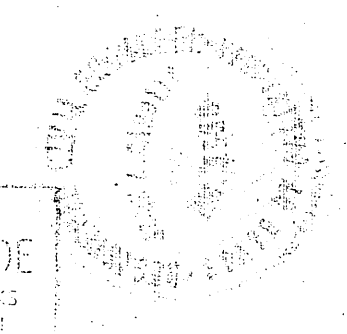


AS BUILT, JULY 1959

REVISIONS		DESCRIPTION
Δ	11-12-57	REVISIONS REQUIRED BY THE U.R.R. CO.

DESIGNED BY G.W.C.	CHECKED BY G.W.C.	APPROVED BY <i>John A. Carollo</i>
DATE 9-30-57		SHEET 5 OF 15



PROPERTY OF  
CITY OF RIVERSIDE  
DEPARTMENT OF PUBLIC WORKS

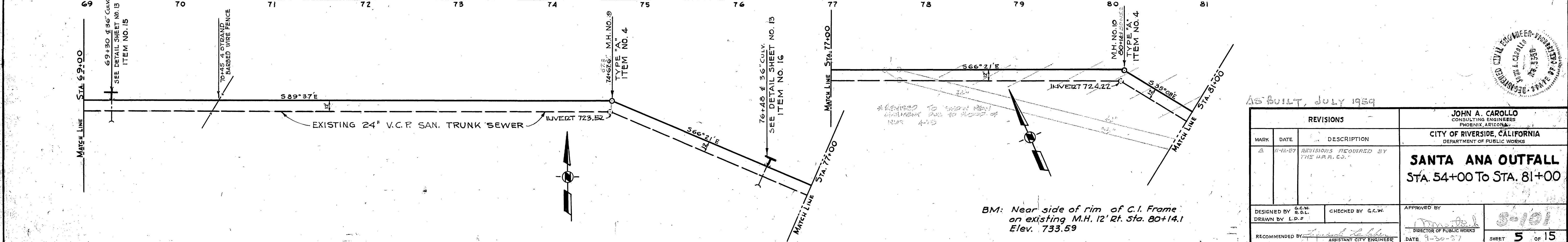
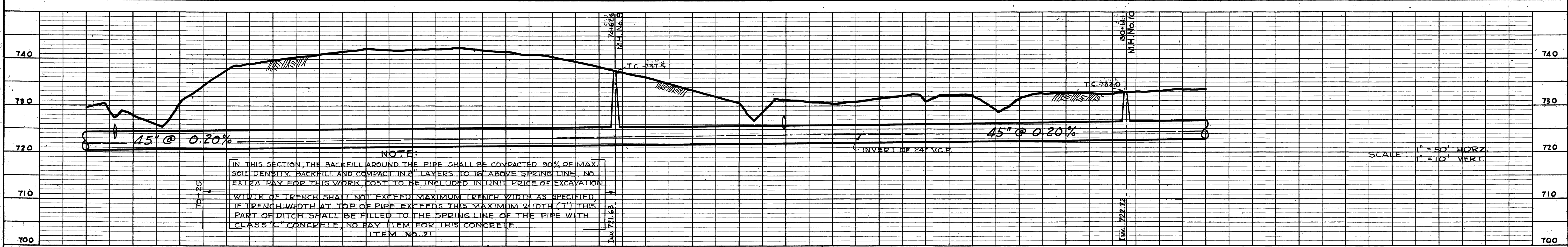
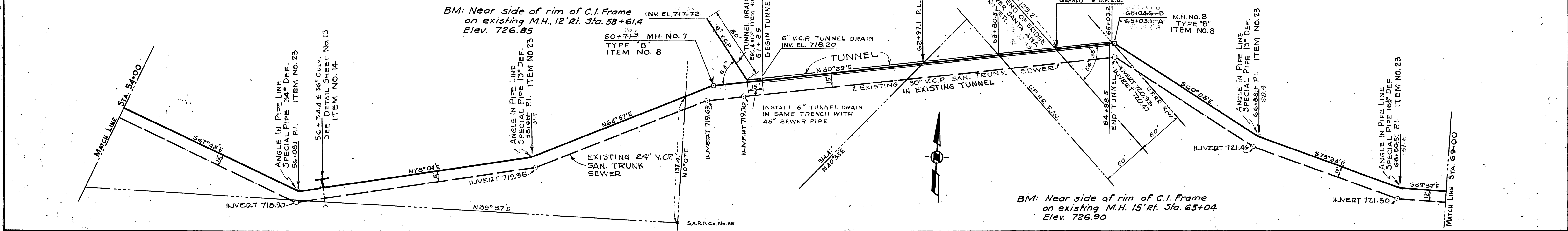
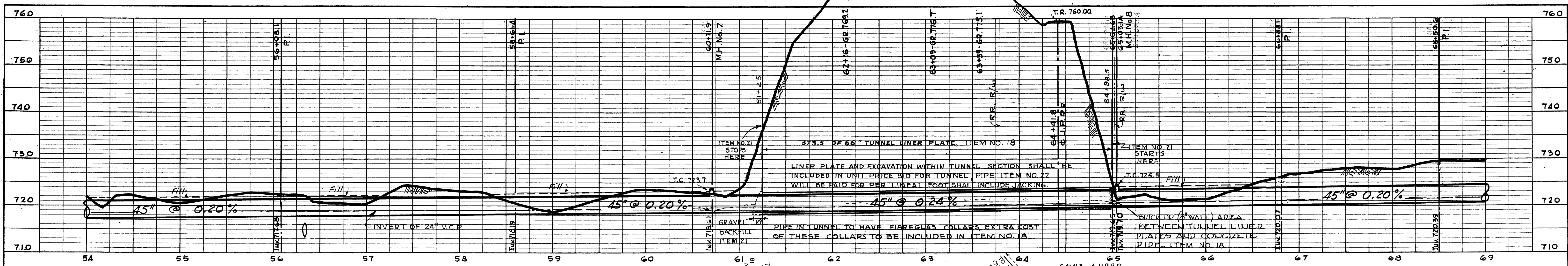
JOHN A. CAROLLO  
CONSULTING ENGINEER  
PHOENIX, ARIZONA

CITY OF RIVERSIDE, CALIFORNIA  
DEPARTMENT OF PUBLIC WORKS

**SANTA ANA OUTFALL**  
STA. 54+00 TO STA. 81+00

PROPERTY OF  
CITY OF RIVERSIDE  
DEPARTMENT OF PUBLIC WORKS





**NOTE:**  
 IN THIS SECTION, THE BACKFILL AROUND THE PIPE SHALL BE COMPACTED 90% OF MAX. SOIL DENSITY BACKFILL AND COMPACT IN 8" LAYERS TO 16" ABOVE SPRING LINE. NO EXTRA PAY FOR THIS WORK, COST TO BE INCLUDED IN UNIT PRICE OF EXCAVATION.  
 WIDTH OF TRENCH SHALL NOT EXCEED MAXIMUM TRENCH WIDTH AS SPECIFIED. IF TRENCH WIDTH AT TOP OF PIPE EXCEEDS THIS MAXIMUM WIDTH (T) THIS PART OF DITCH SHALL BE FILLED TO THE SPRING LINE OF THE PIPE WITH CLASS "C" CONCRETE. NO PAY ITEM FOR THIS CONCRETE.  
 ITEM NO. 21

AS BUILT, JULY 1959

REVISIONS		
MARK	DATE	DESCRIPTION
Δ	11-16-57	REVISIONS REQUIRED BY THE A.R.P. CO.

DESIGNED BY G.C.W. CHECKED BY G.C.W. APPROVED BY [Signature]  
 DRAWN BY L.P.S. DIRECTOR OF PUBLIC WORKS  
 RECOMMENDED BY [Signature] ASSISTANT CITY ENGINEER DATE 7-20-57

**JOHN A. CAROLLO**  
 CONSULTING ENGINEER  
 PHOENIX, ARIZONA

**CITY OF RIVERSIDE, CALIFORNIA**  
 DEPARTMENT OF PUBLIC WORKS

**SANTA ANA OUTFALL**  
 STA. 54+00 TO STA. 81+00

5-101

DATE 7-20-57

SHEET 5 OF 15

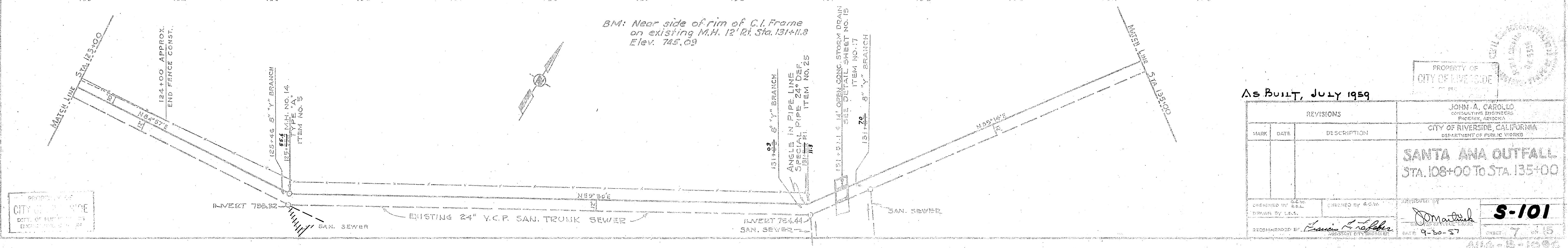
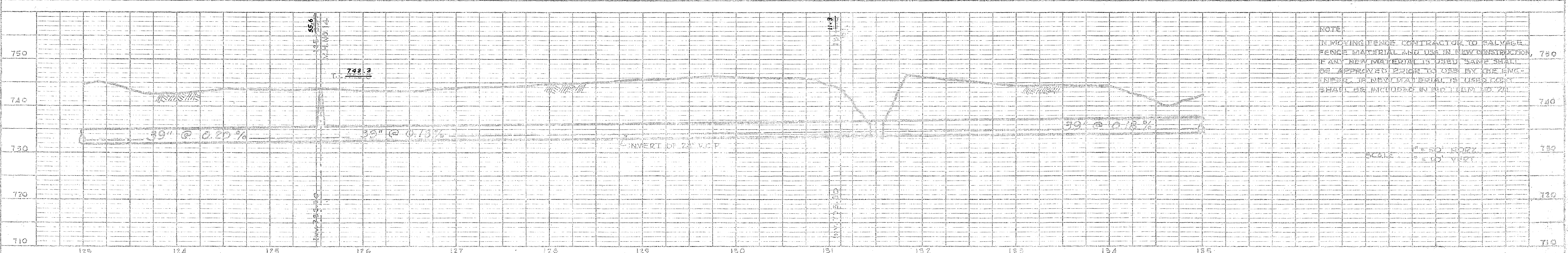
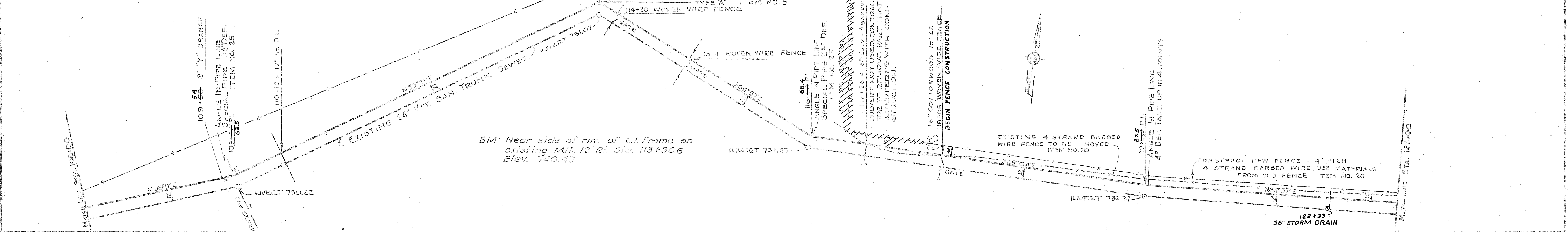
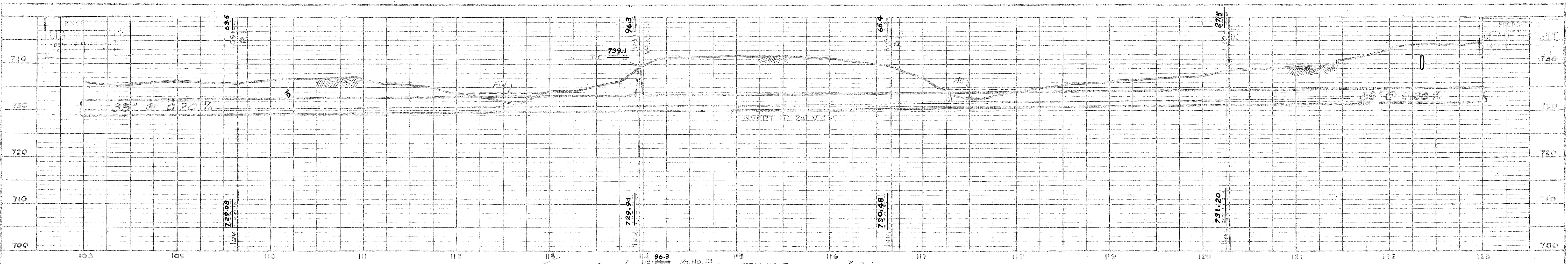












NOTE  
 REMOVING FENCE CONTRACTOR TO SALVAGE  
 FENCE MATERIAL AND USE IN NEW CONSTRUCTION.  
 FENCE NEW MATERIAL IS TO BE SAME SECT.  
 OR APPROX. EQUAL TO USE BY THE FENCE  
 OWNER. IF NEW MATERIAL IS USED FOR  
 THAT BE INCLUDED IN BUDGET ITEM NO. 20

SCALE  
 1" = 20' HORIZ.  
 1" = 10' VERT.

PROPERTY OF  
 CITY OF RIVERSIDE  
 ENGINEERING DEPARTMENT

PROPERTY OF  
 CITY OF RIVERSIDE  
 ENGINEERING DEPARTMENT

As BUILT, JULY 1959

REVISIONS		
MARK	DATE	DESCRIPTION

JOHN A. CARROLL  
 CONSULTING ENGINEER  
 PHOENIX, ARIZONA  
 CITY OF RIVERSIDE, CALIFORNIA  
 DEPARTMENT OF PUBLIC WORKS

SANTA ANA OUTFALL  
 STA. 108+00 TO STA. 135+00

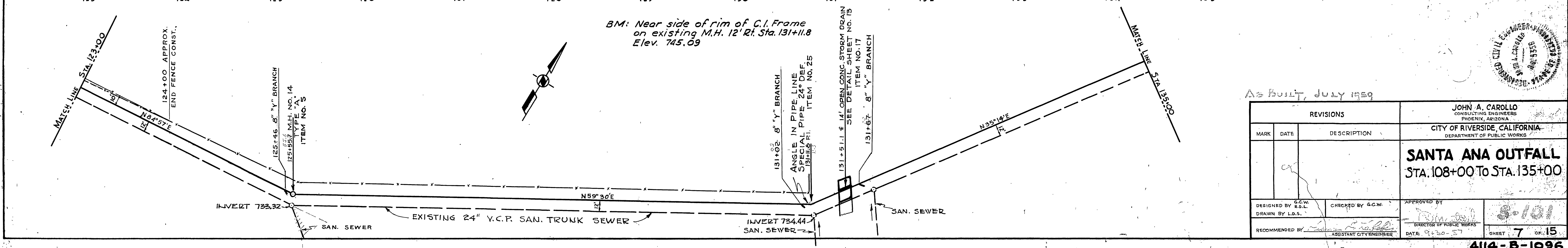
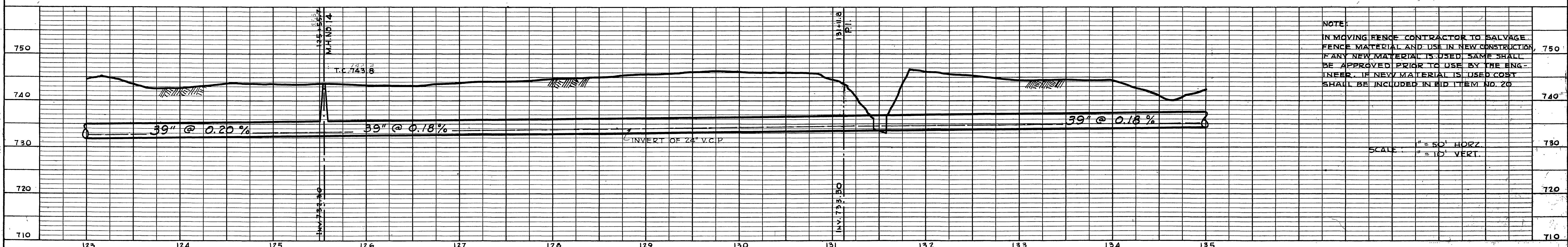
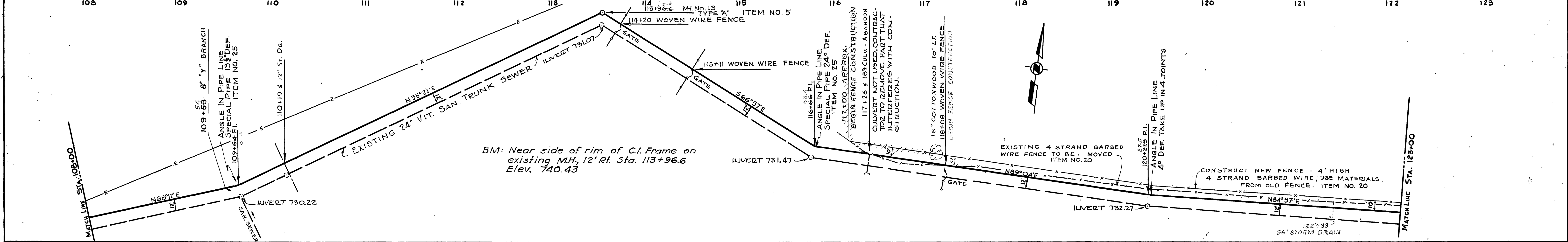
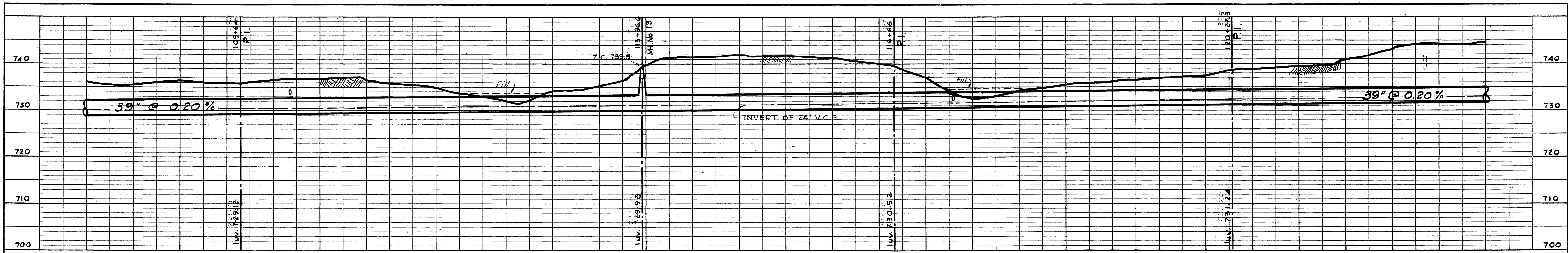
APPROVED BY  
  
 DATE 9-30-57

S-101

7 of 15

410-15-1950





NOTE:  
 IN MOVING FENCE CONTRACTOR TO SALVAGE FENCE MATERIAL AND USE IN NEW CONSTRUCTION. IF ANY NEW MATERIAL IS USED, SAME SHALL BE APPROVED PRIOR TO USE BY THE ENGINEER. IF NEW MATERIAL IS USED COST SHALL BE INCLUDED IN BID ITEM NO. 20

SCALE: 1" = 50' HORIZ.  
 1" = 10' VERT.

As Built, July 1969

REVISIONS		DESCRIPTION	APPROVED BY
MARK	DATE		

DESIGNED BY G.C.W. & S.L. CHECKED BY G.C.W. APPROVED BY [Signature]  
 DRAWN BY L.D.S. DIRECTOR OF PUBLIC WORKS  
 RECOMMENDED BY [Signature] ASSISTANT CITY ENGINEER DATE 9-20-57

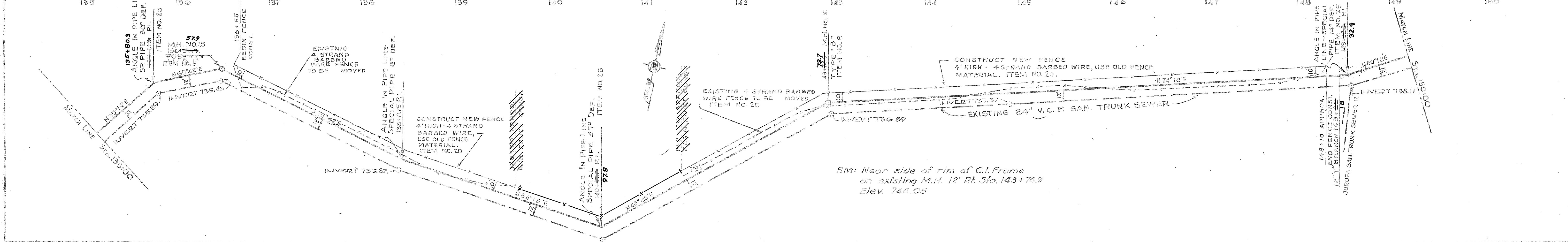
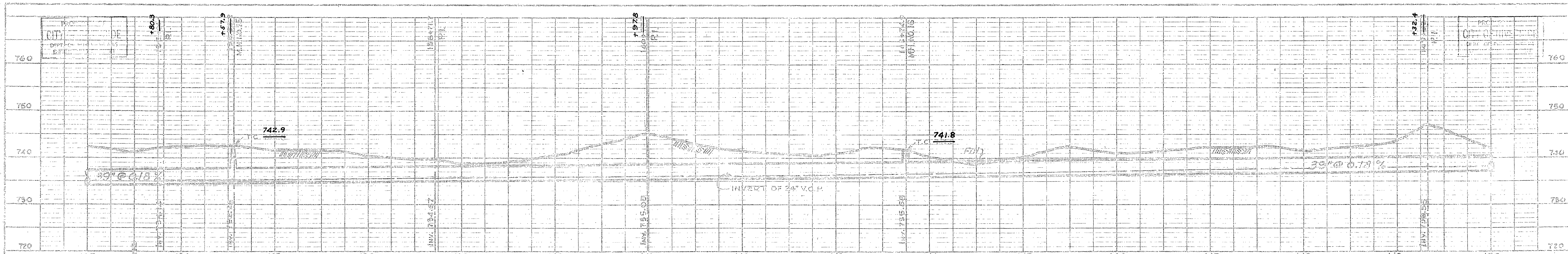
JOHN A. CAROLLO  
 CONSULTING ENGINEER  
 PHOENIX, ARIZONA

CITY OF RIVERSIDE, CALIFORNIA  
 DEPARTMENT OF PUBLIC WORKS

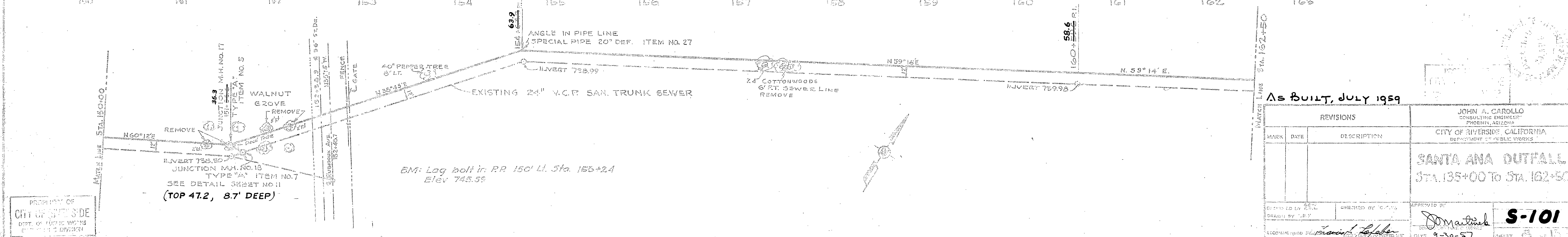
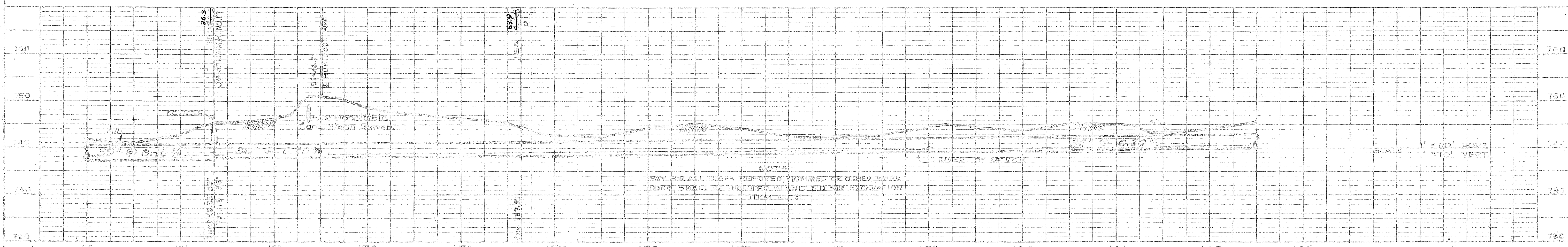
**SANTA ANA OUTFALL**  
 STA. 108+00 TO STA. 135+00

DATE 9-20-57 SHEET 7 OF 15





BM: Near side of rim of C.I. Frame  
on existing M.H. 12' Rt. Sta. 143+74.9  
Elev. 744.05



BM: Log bolt in RR 150' Lt. Sta. 153+24  
Elev. 745.55

PROPERTY OF  
CITY OF RIVERSIDE  
DEPT. OF PUBLIC WORKS  
SEWERAGE DIVISION

(TOP 47.2, 8.7' DEEP)

As BUILT, JULY 1959

REVISIONS		
MARK	DATE	DESCRIPTION

JOHN A. CAROLLO  
CONSULTING ENGINEER  
PHOENIX, ARIZONA  
CITY OF RIVERSIDE, CALIFORNIA  
DEPARTMENT OF PUBLIC WORKS

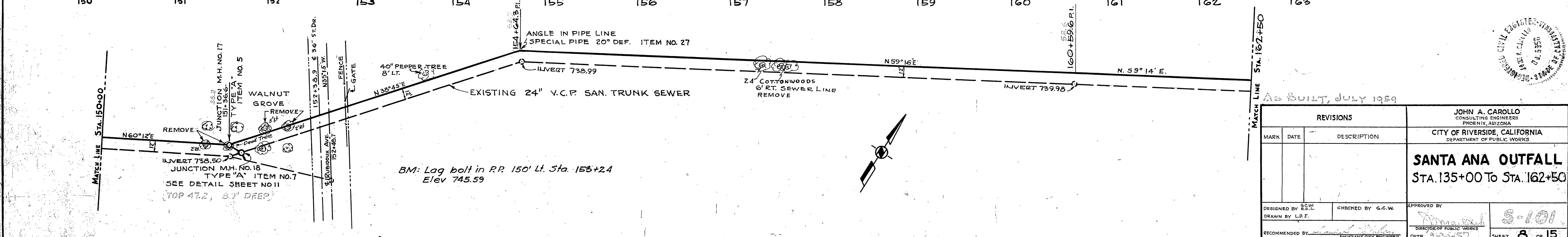
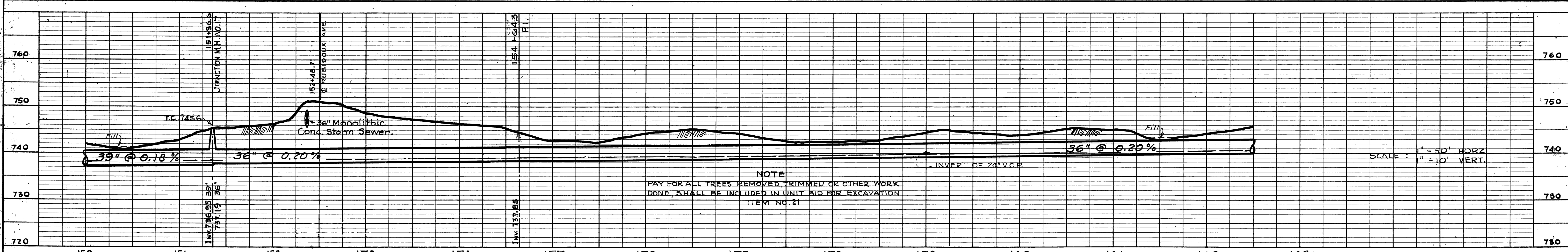
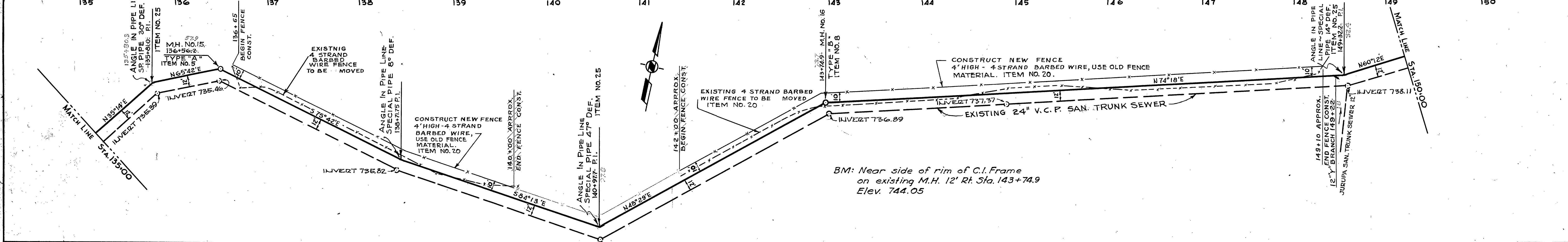
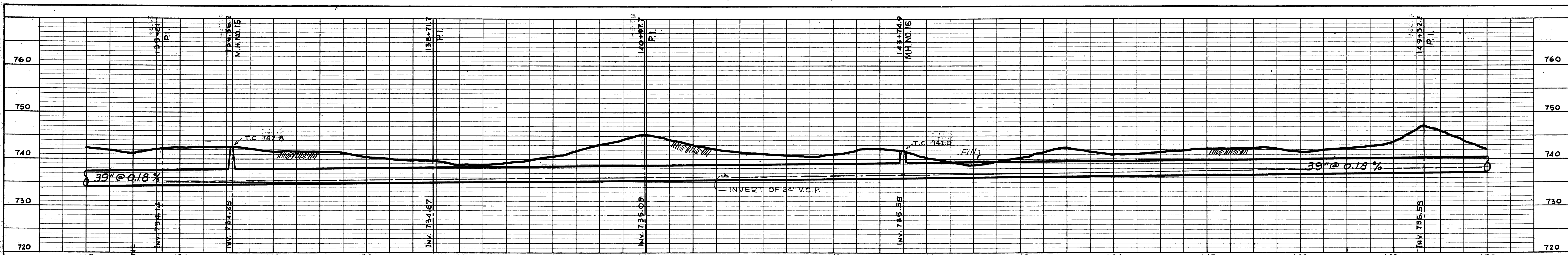
SANTA ANA OUTFALL  
STA. 135+00 TO STA. 162+50

DESIGNED BY: J.A.C. CHECKED BY: J.A.C. APPROVED BY: J.A.C.  
DRAWN BY: J.A.C. DATE: 9-30-57 SHEET: 8 OF 10  
RECORDING BY: J.A.C. DATE: 9-30-57

S-101

4113-B-1957





REVISIONS		
MARK	DATE	DESCRIPTION

DESIGNED BY R.W. CHECKED BY G.C.W. APPROVED BY [Signature]  
 DRAWN BY L.B.J. DIRECTOR OF PUBLIC WORKS  
 RECOMMENDED BY [Signature] ASSISTANT CITY ENGINEER DATE 9-30-57

As BUILT, JULY 1959

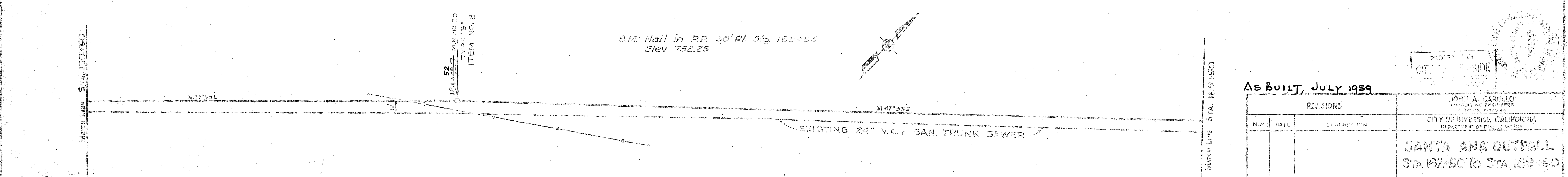
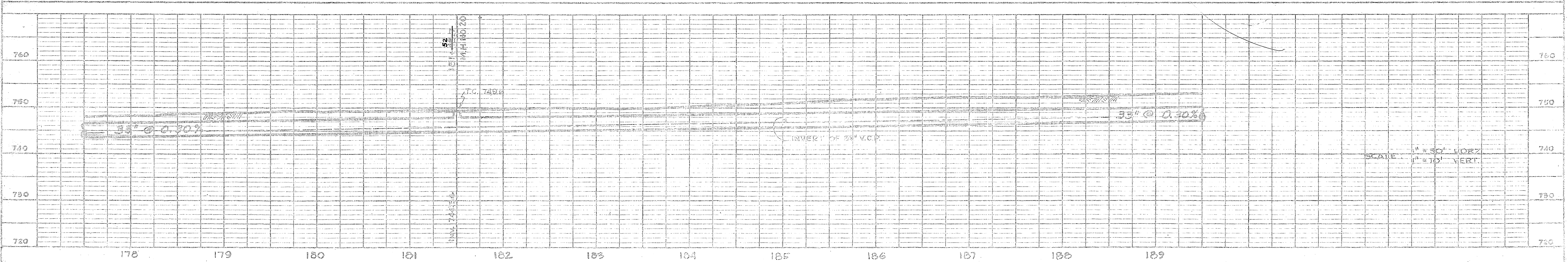
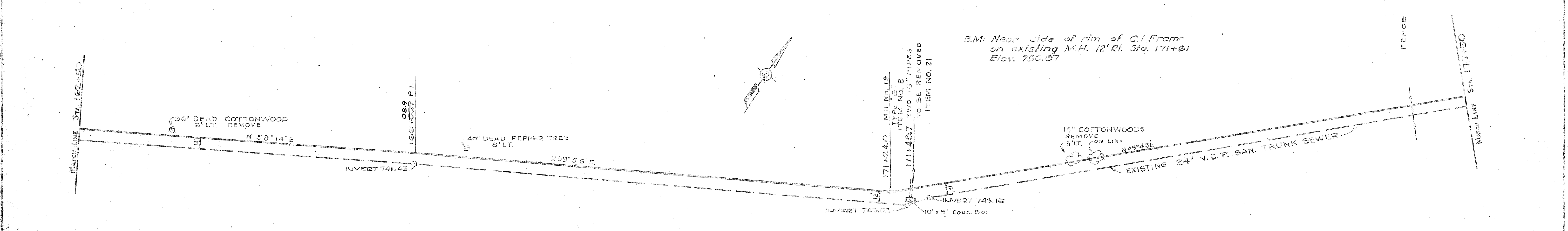
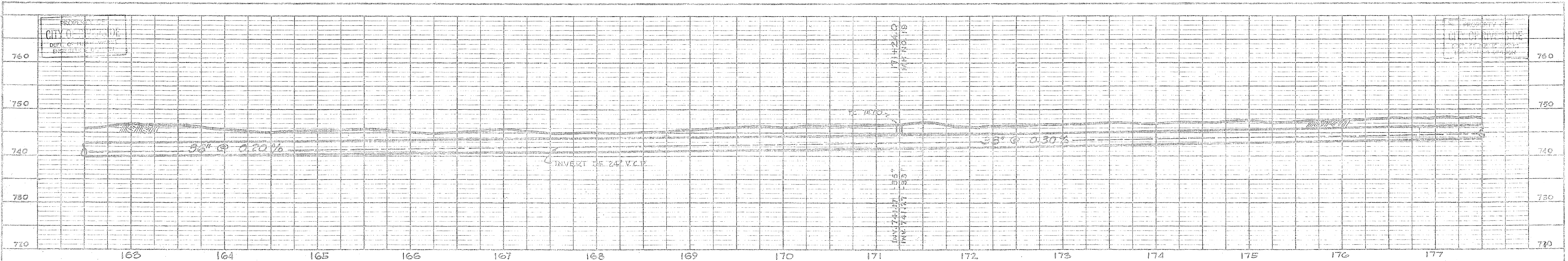
JOHN A. CAROLLO  
 CONSULTING ENGINEERS  
 PHOENIX, ARIZONA

CITY OF RIVERSIDE, CALIFORNIA  
 DEPARTMENT OF PUBLIC WORKS

**SANTA ANA OUTFALL**  
 STA. 135+00 TO STA. 162+50

5-101  
 8 OF 15





AS BUILT, JULY 1959

REVISIONS		DESCRIPTION
MARK	DATE	

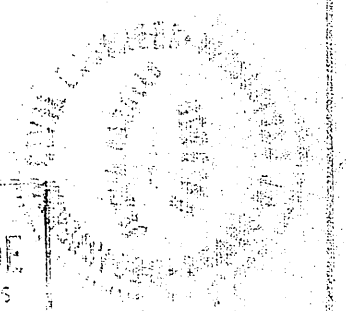
DESIGNED BY G.C.W. CHECKED BY G.C.W.  
 DRAWN BY L.O.J. (G.C.W.)  
 RECOMMENDED BY *Thomas J. Toole* ASSISTANT ENGINEER DATE 9-30-57

APPROVED BY *John A. Carollo* CONSULTING ENGINEER  
 CITY OF RIVERSIDE, CALIFORNIA  
 DEPARTMENT OF PUBLIC WORKS

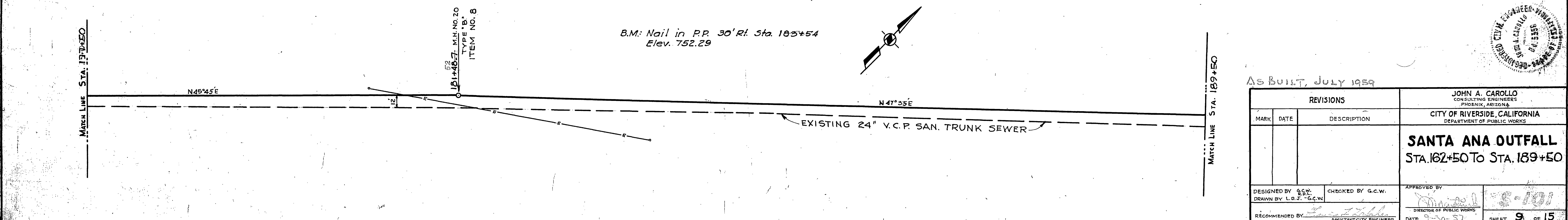
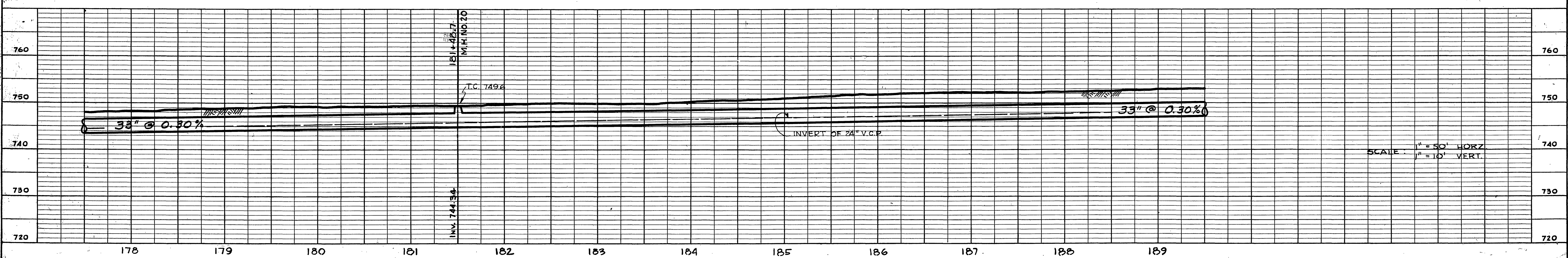
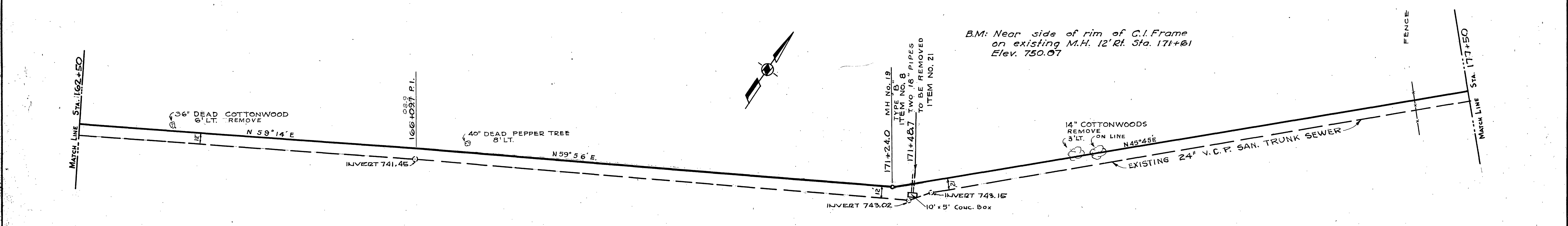
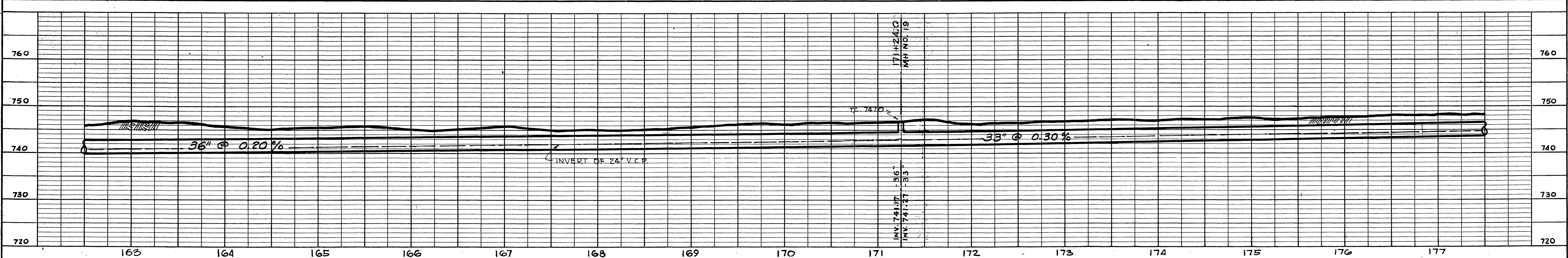
**SANTA ANA OUTFALL**  
 STA. 162+50 TO STA. 189+50

**S-101**  
 SHEET 8 OF 15  
 417-5-1056

PROPERTY OF  
 CITY OF RIVERSIDE  
 DEPT. OF PUBLIC WORKS  
 ENGINEERING DIVISION







AS BUILT, JULY 1959

REVISIONS		DESIGN BY G.C.W. DRAWN BY L.B.J. - G.C.W.	CHECKED BY G.C.W.	APPROVED BY <i>[Signature]</i> DIRECTOR OF PUBLIC WORKS
MARK	DATE			

JOHN A. CAROLLO  
 CONSULTING ENGINEERS  
 PHOENIX, ARIZONA

CITY OF RIVERSIDE, CALIFORNIA  
 DEPARTMENT OF PUBLIC WORKS

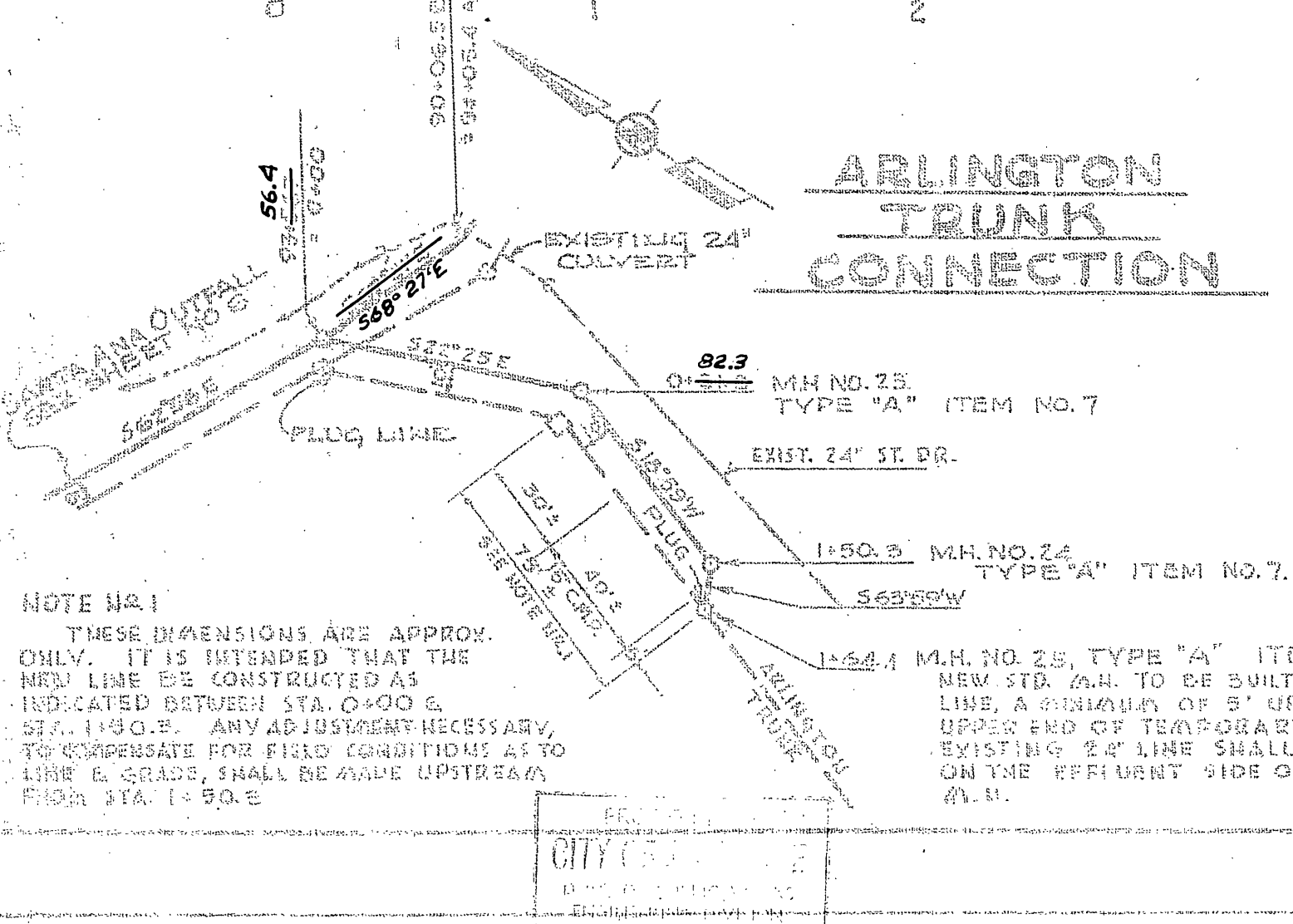
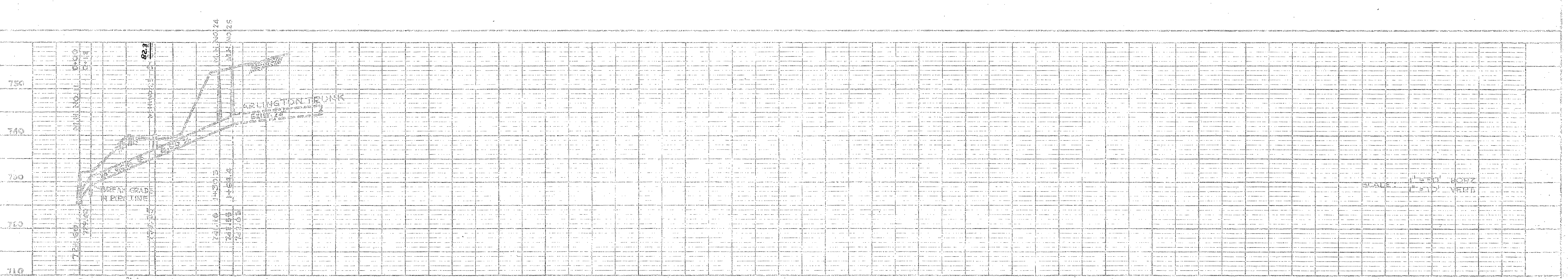
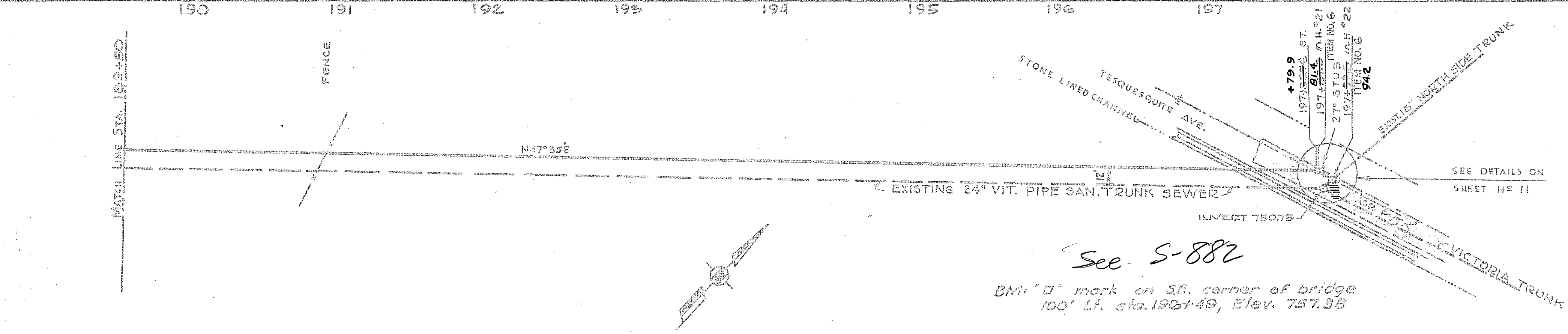
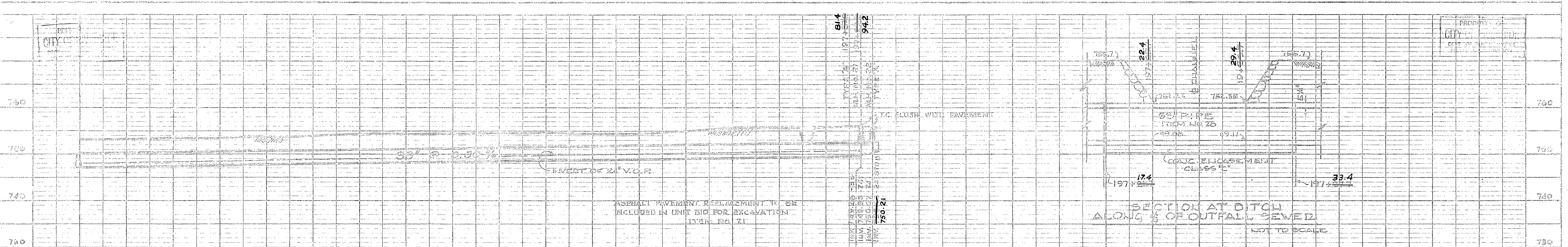
**SANTA ANA OUTFALL**  
 STA. 162+50 TO STA. 189+50

RECOMMENDED BY  
 ASSISTANT CITY ENGINEER

DATE 9-26-57

SHEET 9 OF 15





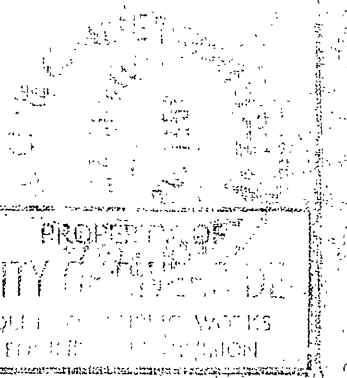
AS BUILT, JULY 1959

REVISIONS		
MARK	DATE	DESCRIPTION

DESIGNED BY: *John A. Carollo* CHECKED BY: *John A. Carollo*  
 DRAWN BY: *John A. Carollo* CITY: 9-30-57

APPROVED BY: *John A. Carollo*

PROJECT NO. **S-101**

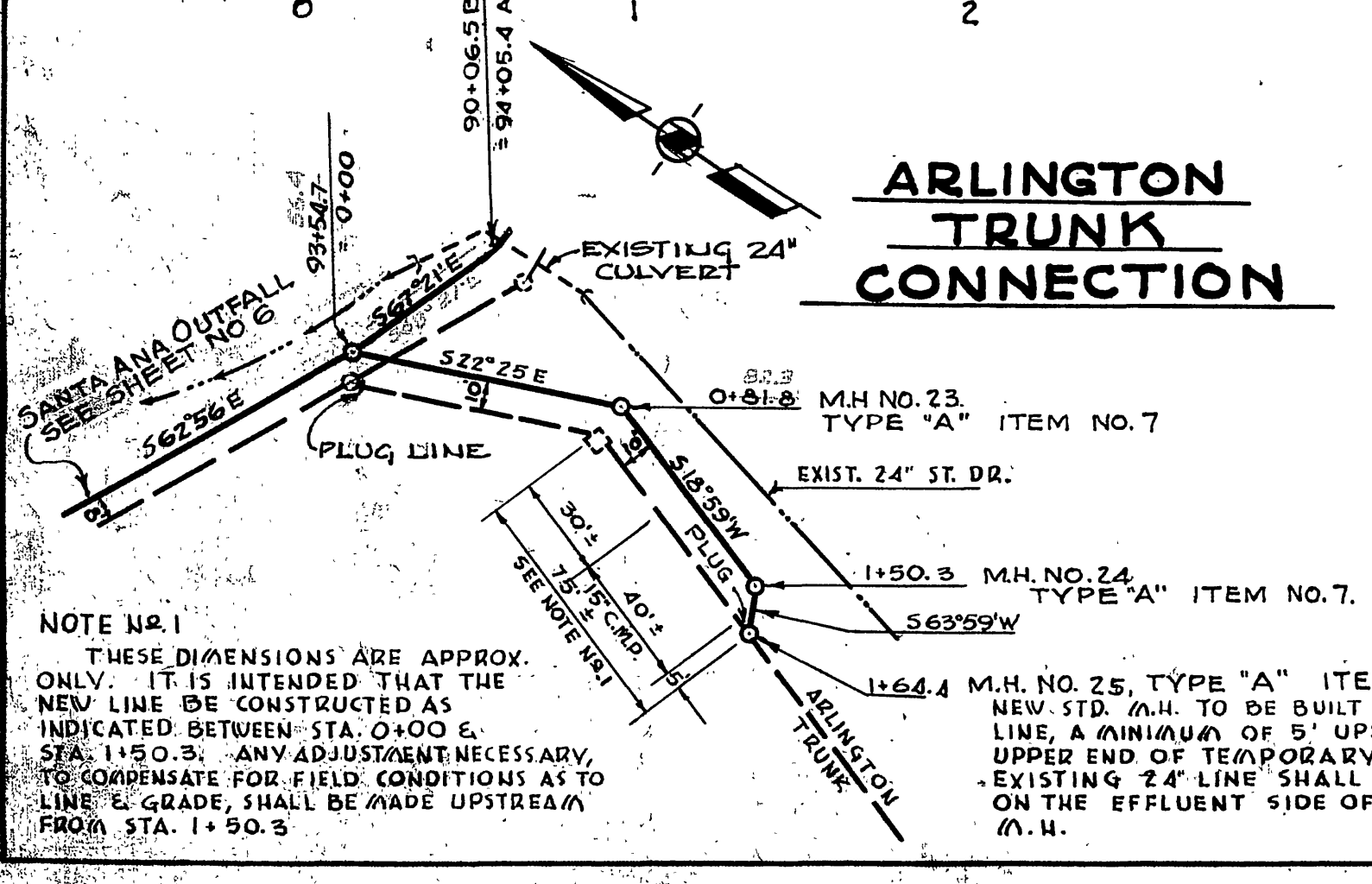
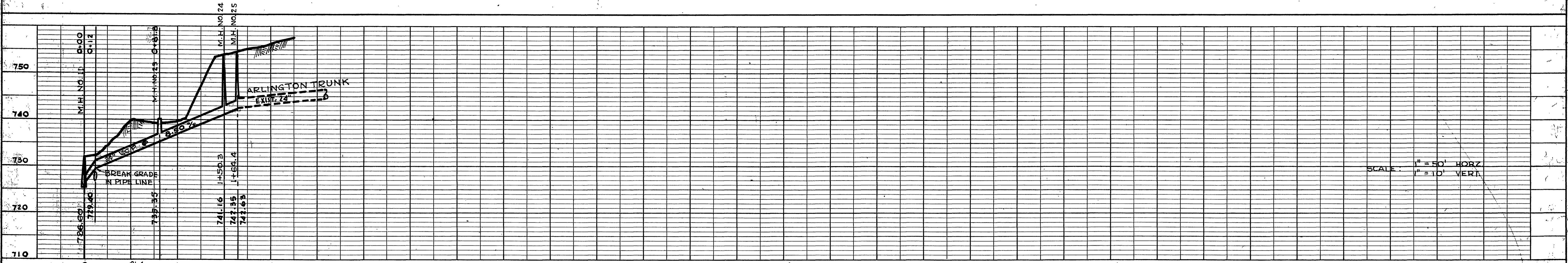
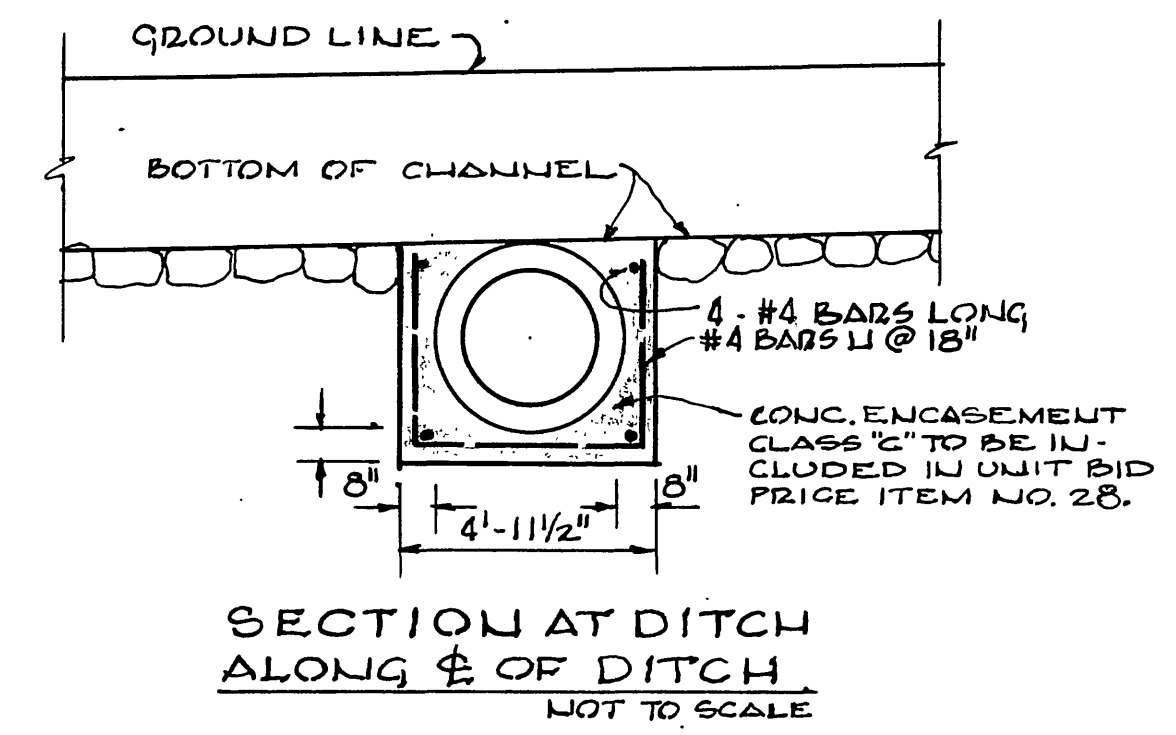
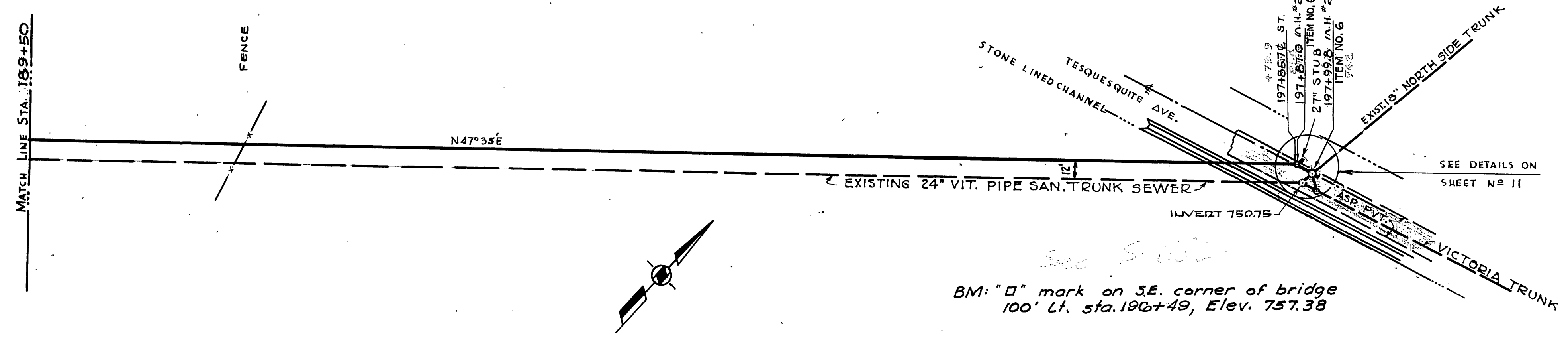
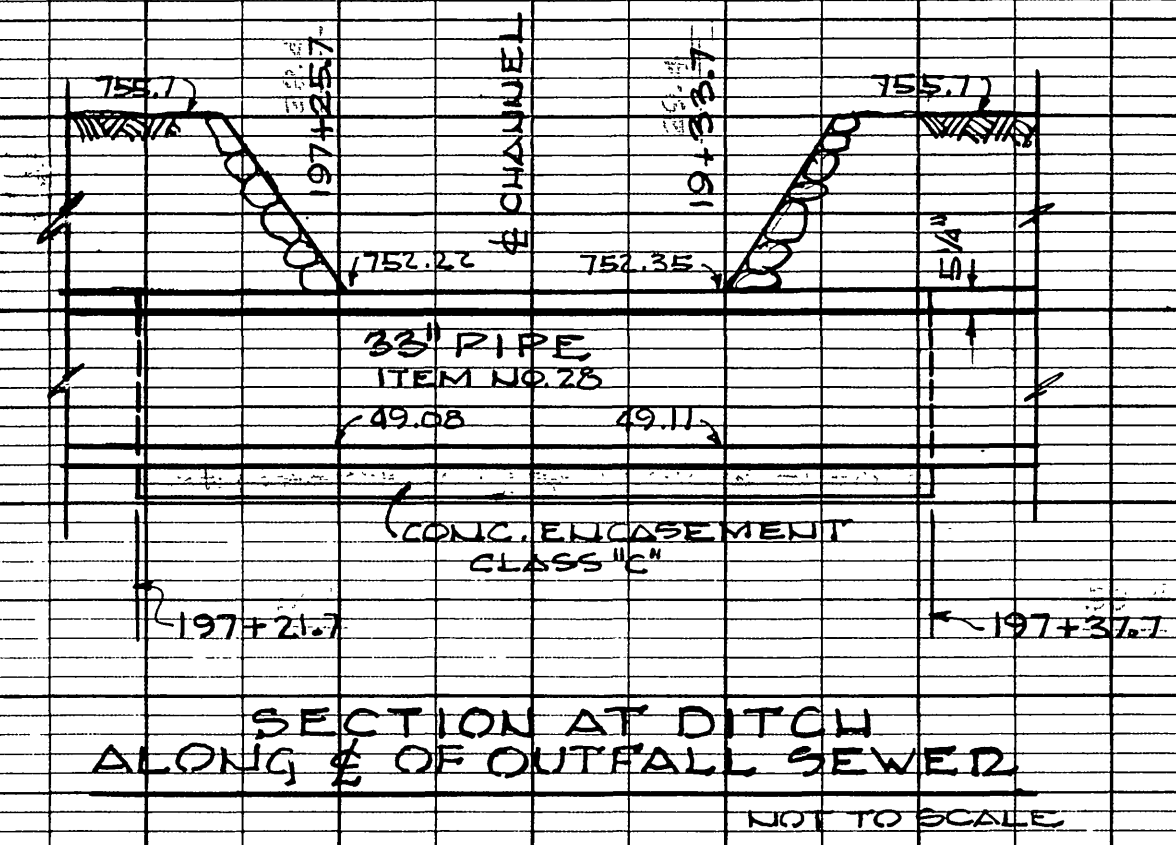
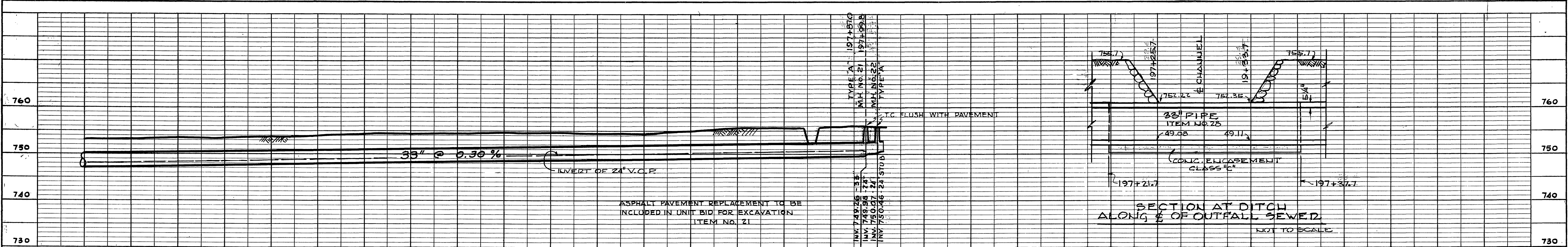


JOHN A. CAROLLO  
 CONSULTING ENGINEER  
 FRESNO, CALIFORNIA

CITY OF RIVERSIDE, CALIFORNIA  
 DEPARTMENT OF PUBLIC WORKS

SANTA ANA OUTFALL  
 STA. 169+50 TO STA. 197+98.6





AS BUILT, JULY 1959.

REVISIONS		
MARK	DATE	DESCRIPTION

DESIGNED BY G.C.W.  
 DRAWN BY L.D.J. G.C.W.  
 CHECKED BY G.C.W.  
 RECOMMENDED BY [Signature] ASSISTANT CITY ENGINEER

APPROVED BY [Signature] DIRECTOR OF PUBLIC WORKS

DATE 7-30-59

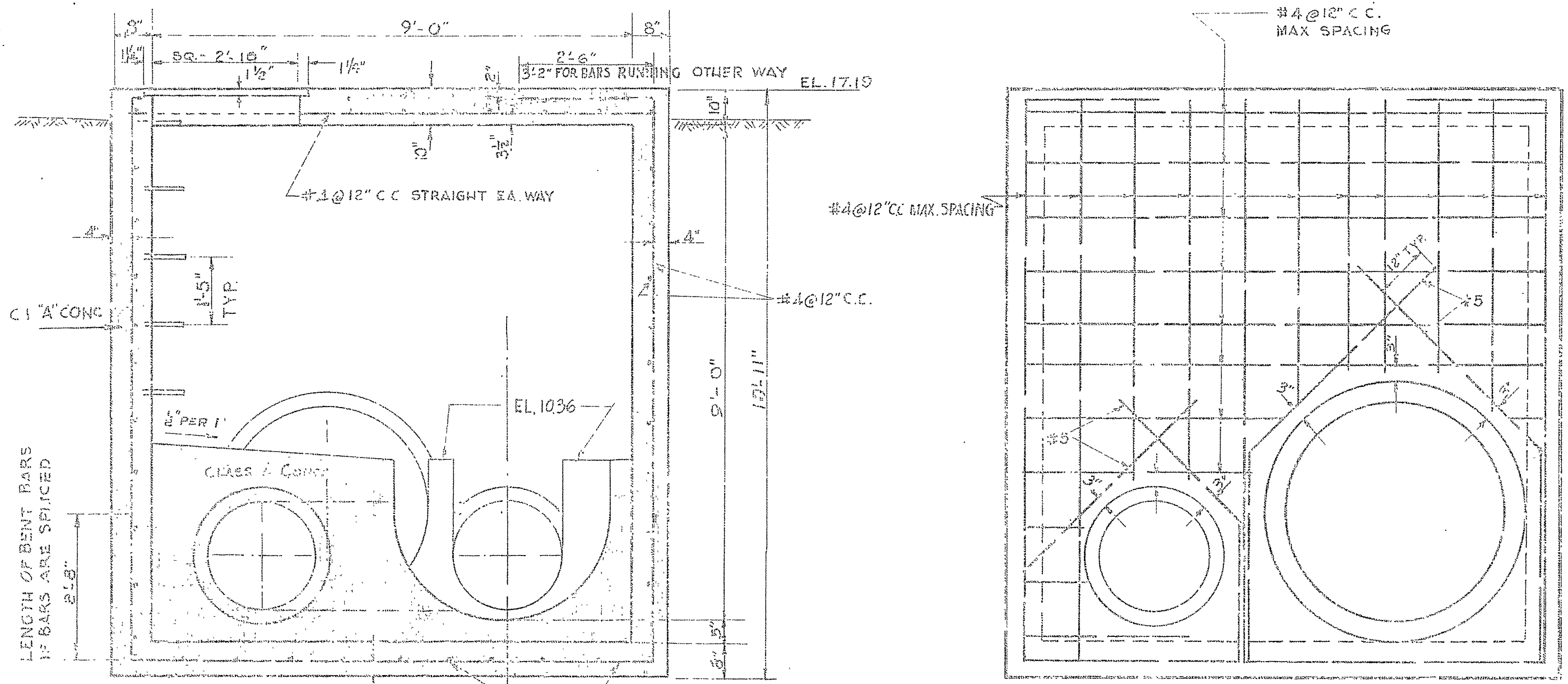
JOHN A. CAROLLO  
 CONSULTING ENGINEERS  
 PHOENIX, ARIZONA

CITY OF RIVERSIDE, CALIFORNIA  
 DEPARTMENT OF PUBLIC WORKS

**SANTA ANA OUTFALL**  
 STA. 189+50 TO STA. 197+99.8

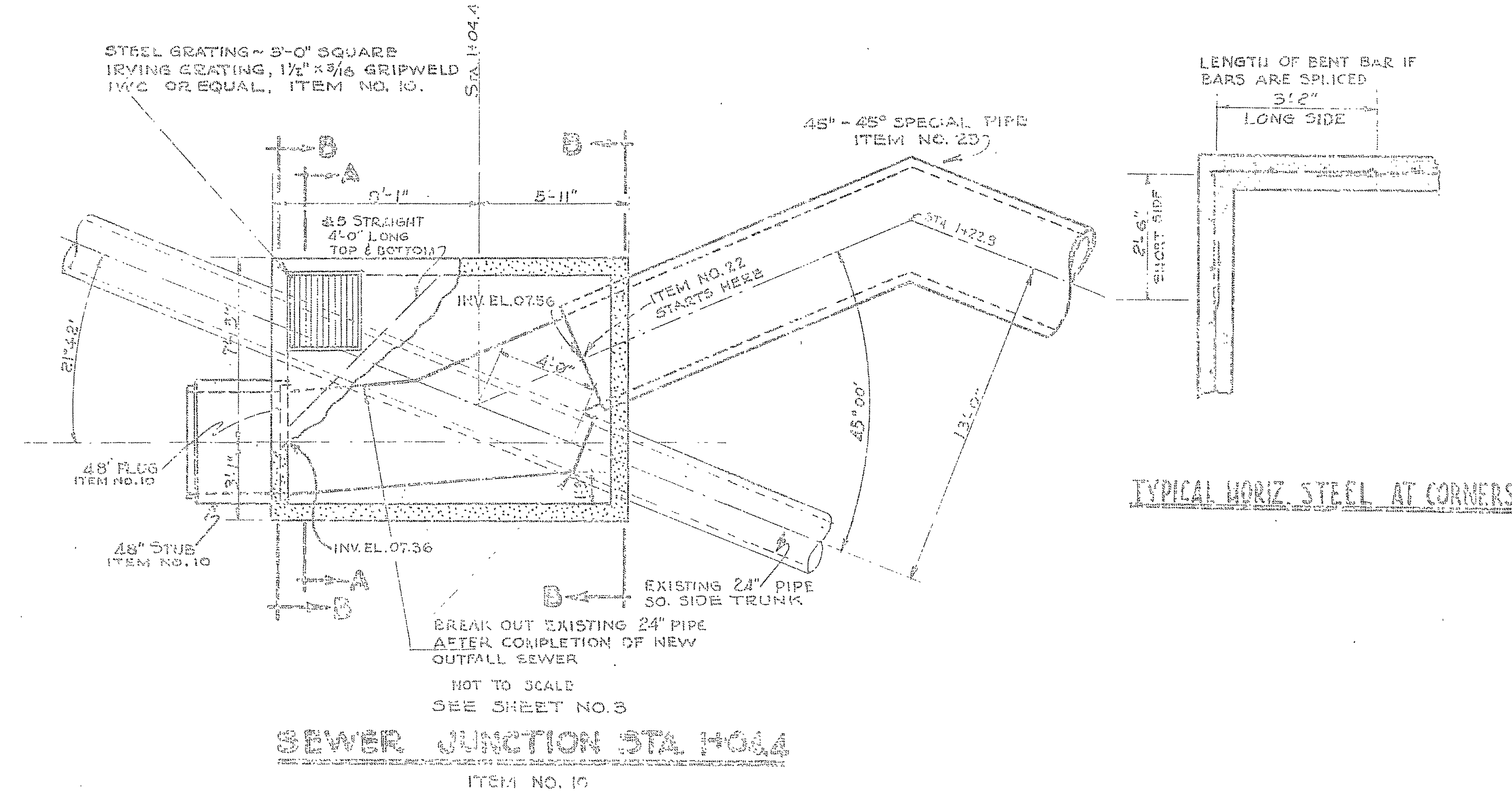
SHEET 10 OF 15



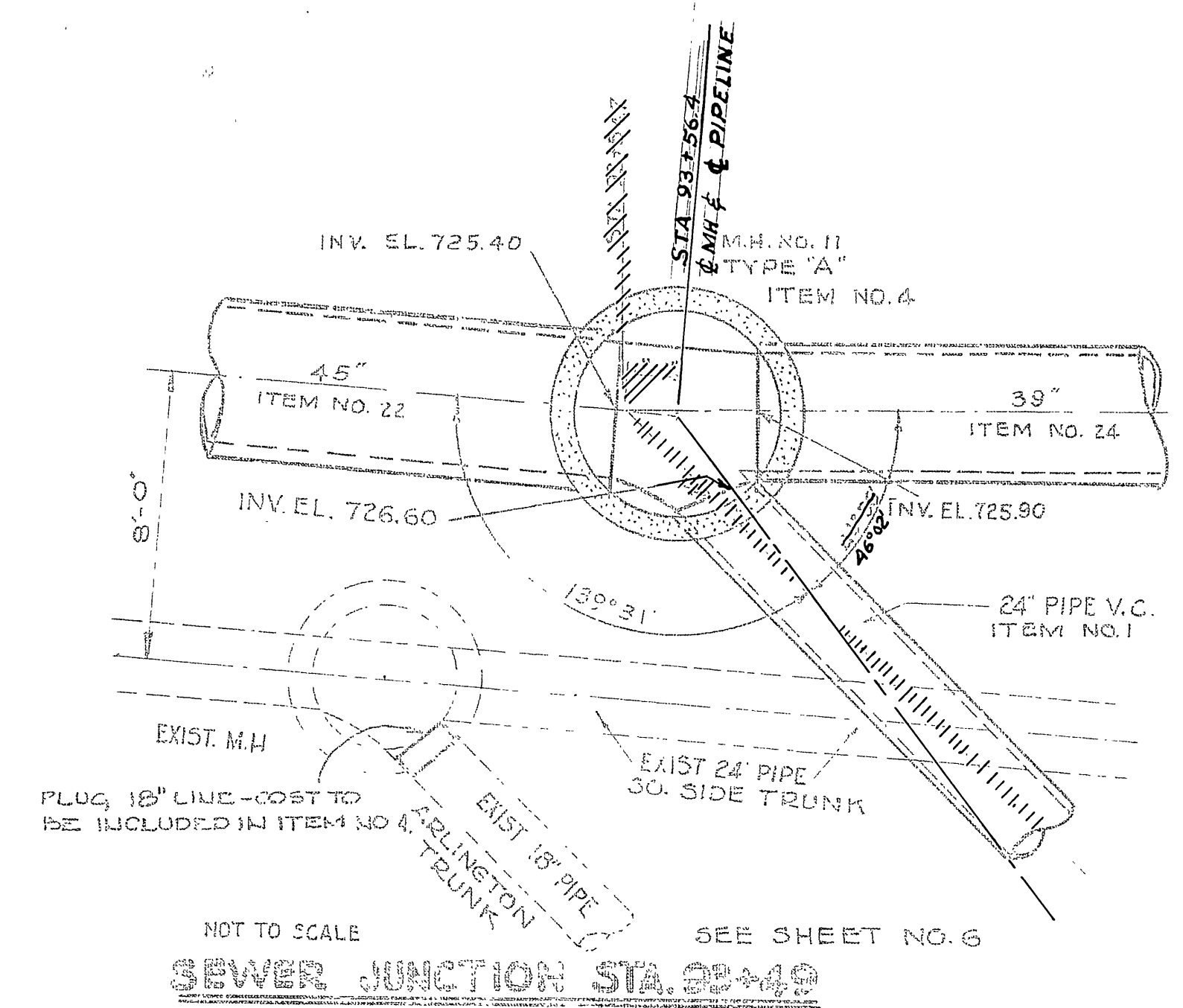


SECTION "A-A"

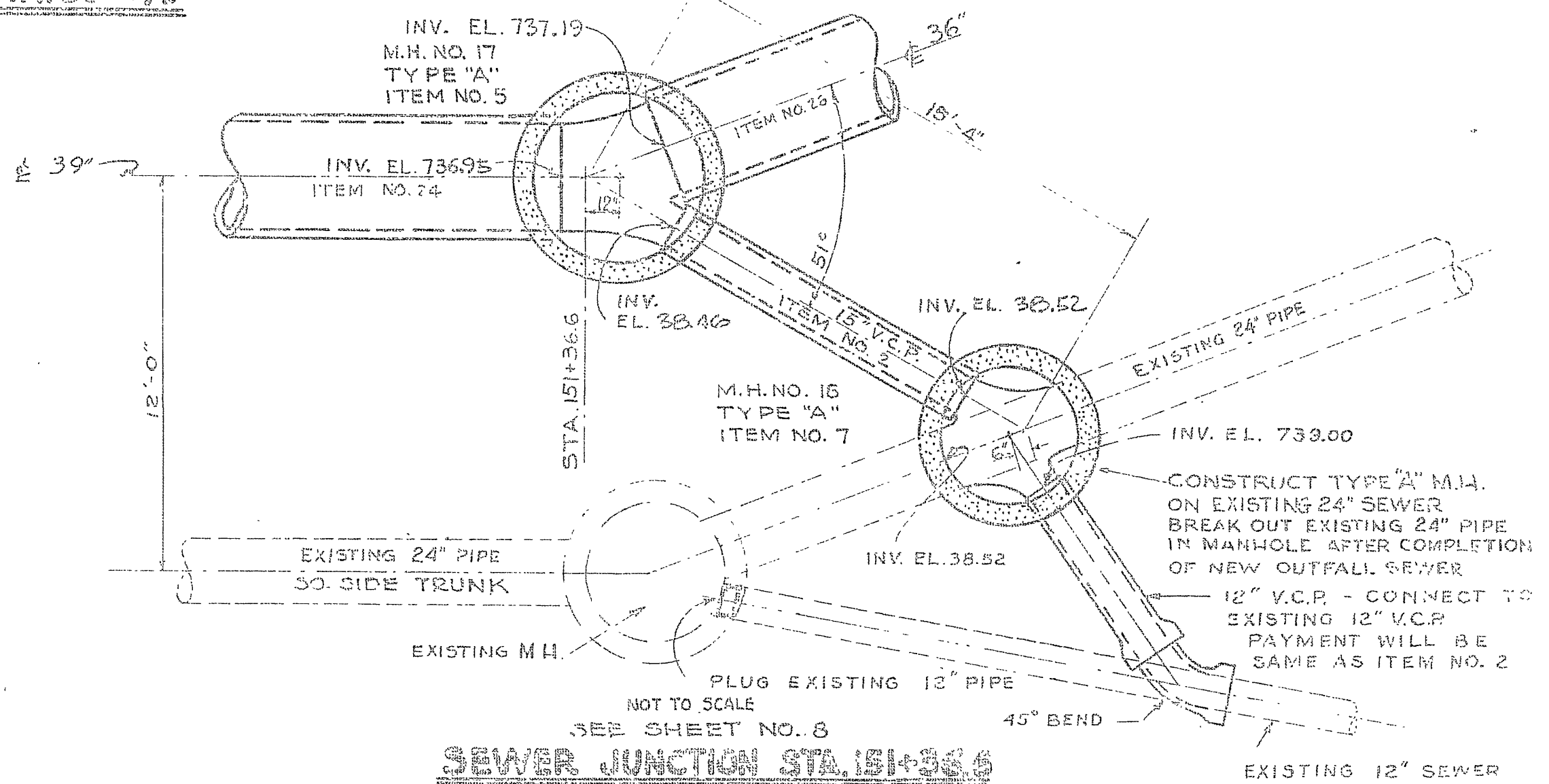
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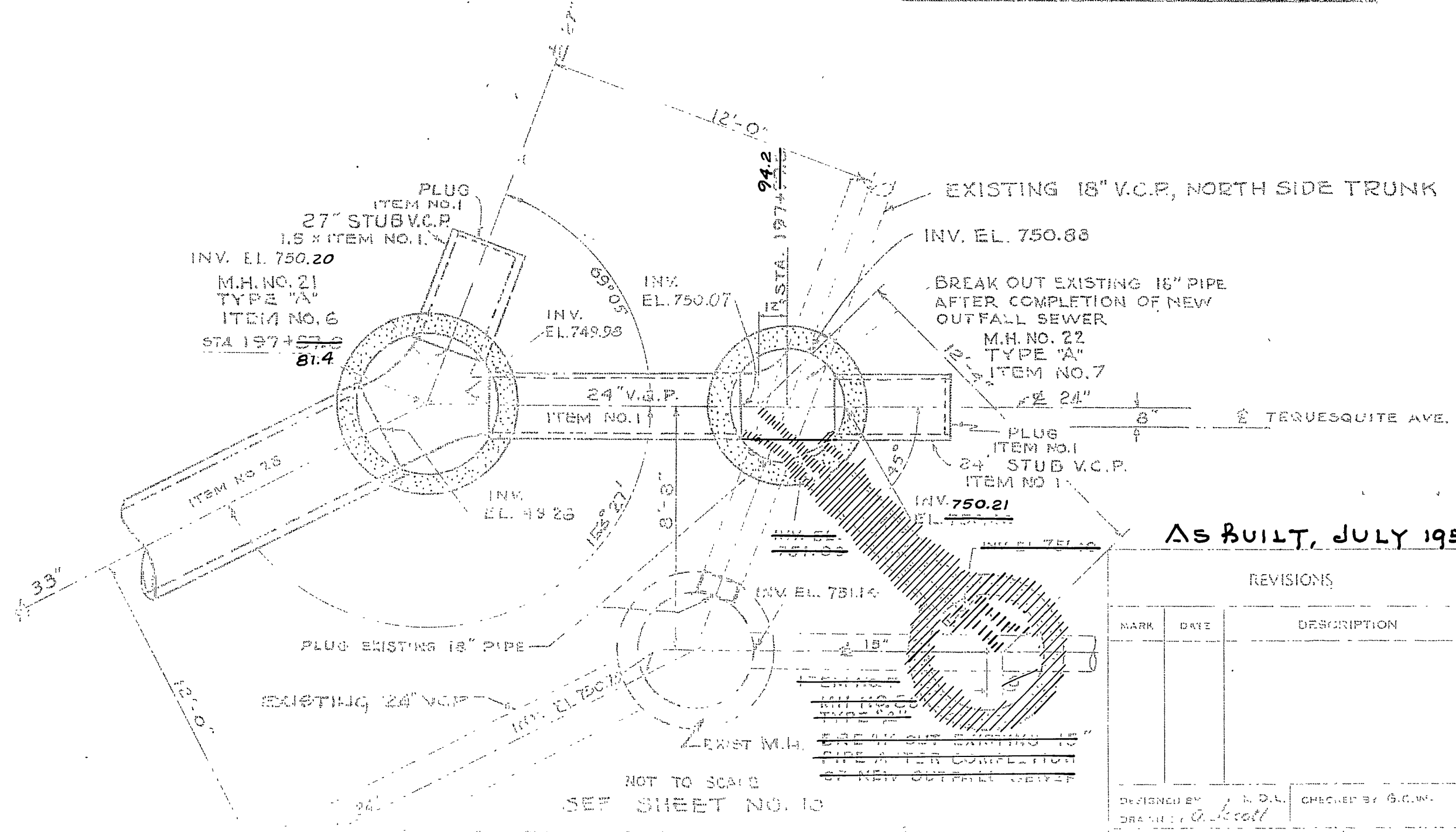
SEWER JUNCTION STA. 104.4  
ITEM NO. 10



SEWER JUNCTION STA. 92+49



SEWER JUNCTION STA. 151+56.6



SEWER JUNCTION STA. 197+94.2

As BUILT, JULY 1959

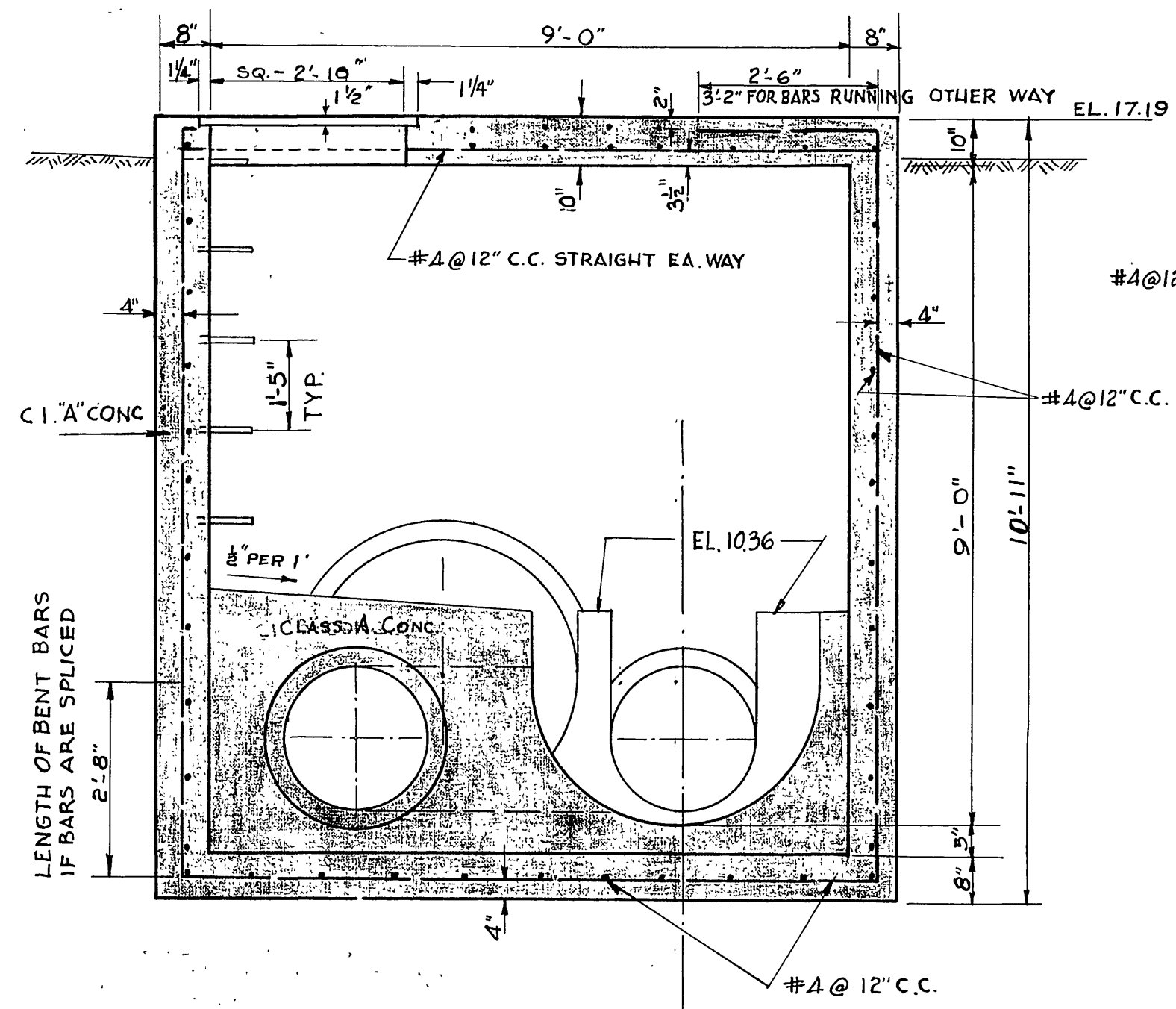
REVISIONS		
MARK	DATE	DESCRIPTION

APPROVED BY: *John A. Carollo*  
 JOHN A. CAROLLO  
 CONSULTING ENGINEER  
 PHOENIX, ARIZONA  
 CITY OF RIVERSIDE, CALIFORNIA  
 DEPARTMENT OF PUBLIC WORKS

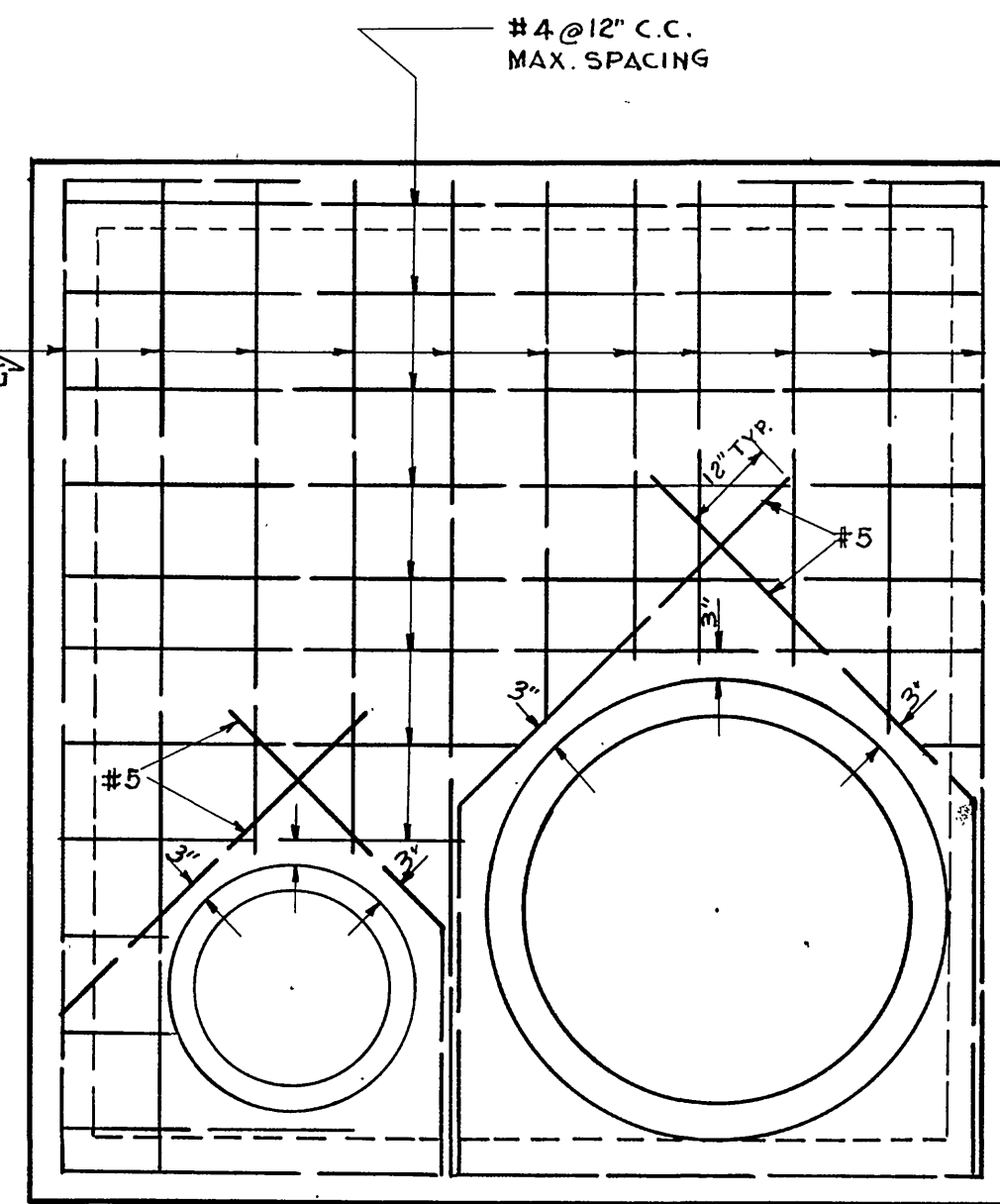
PROJECT NO. 4  
 DATE: 9-30-57

**S-101**

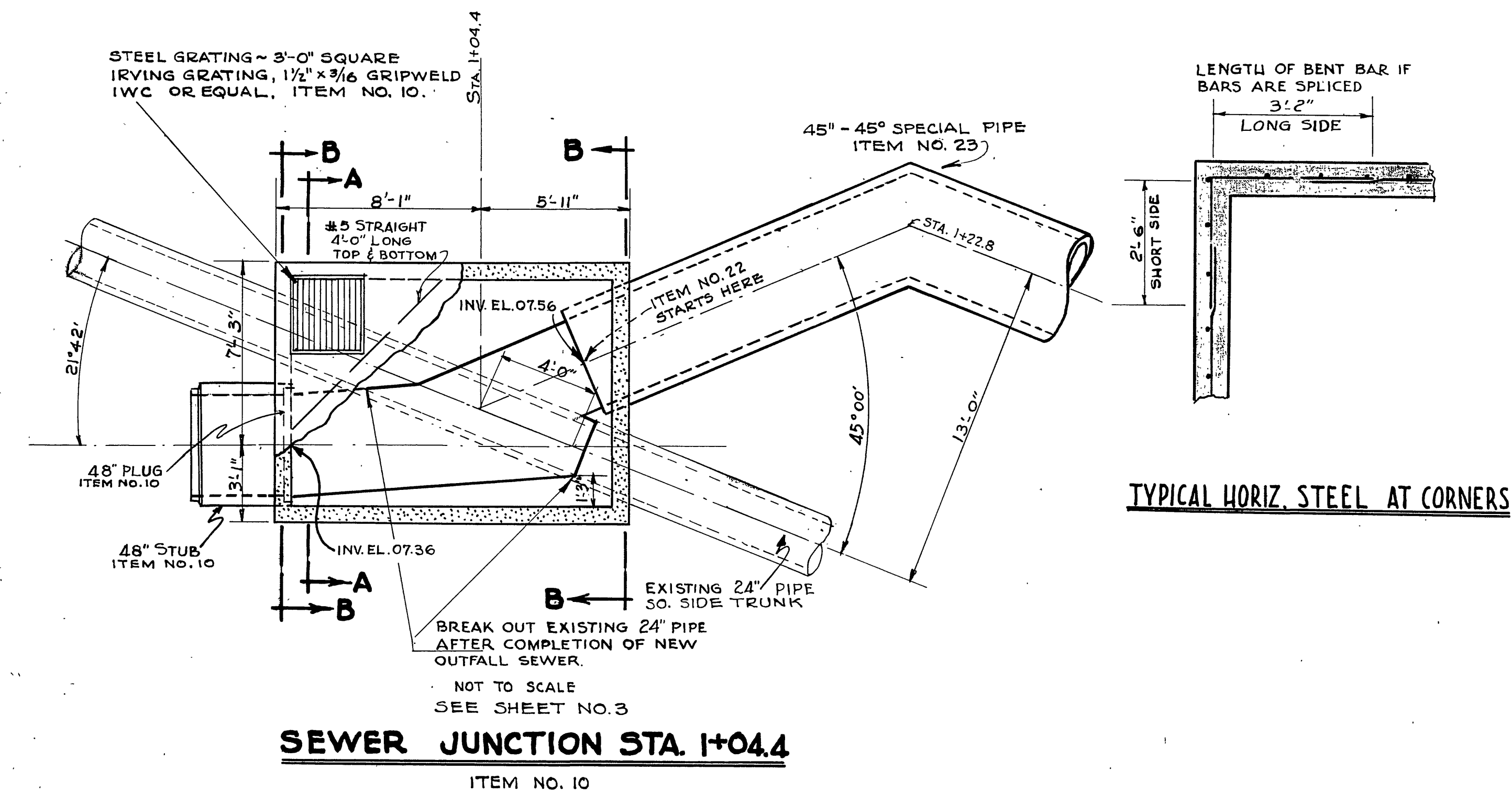




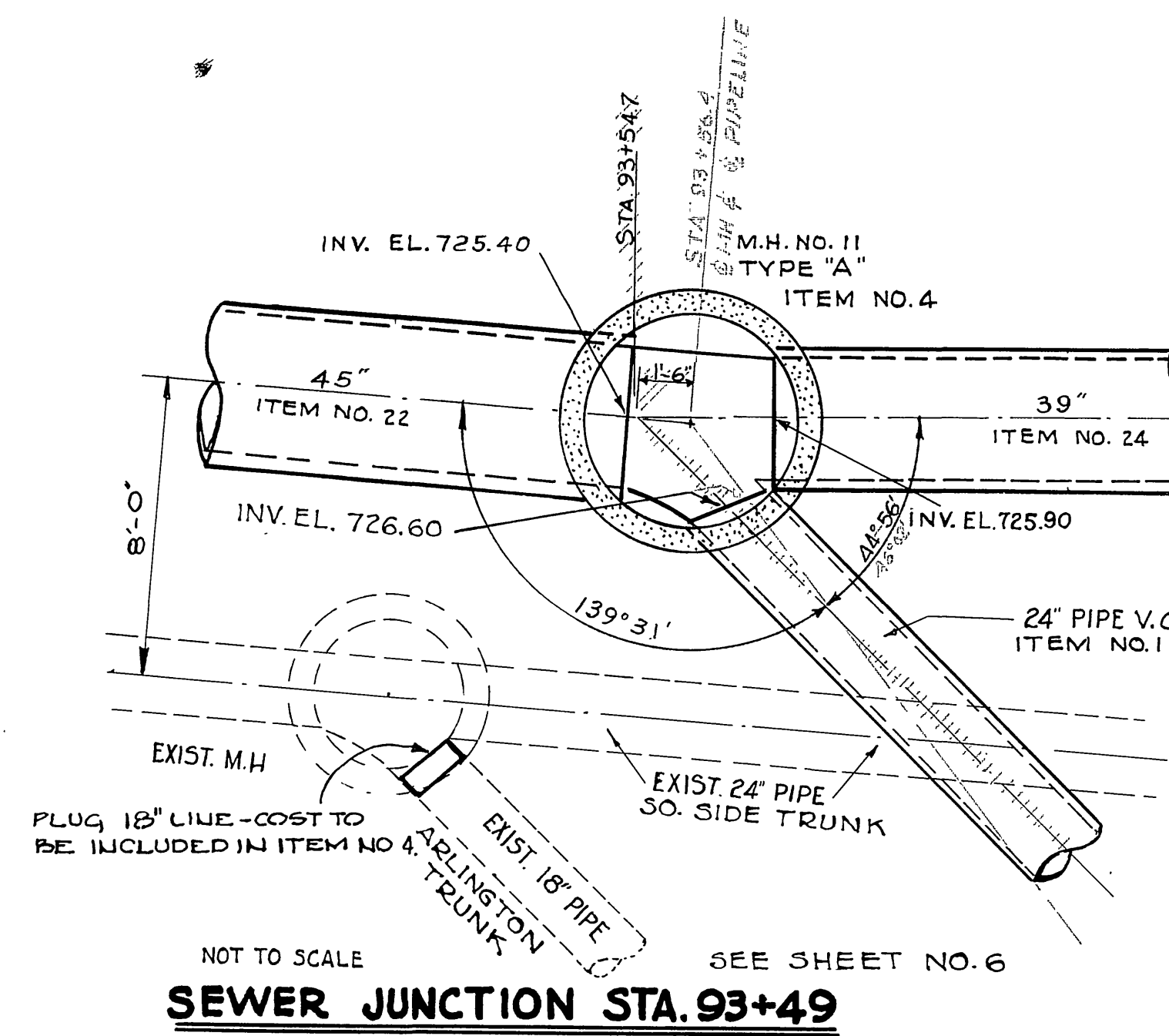
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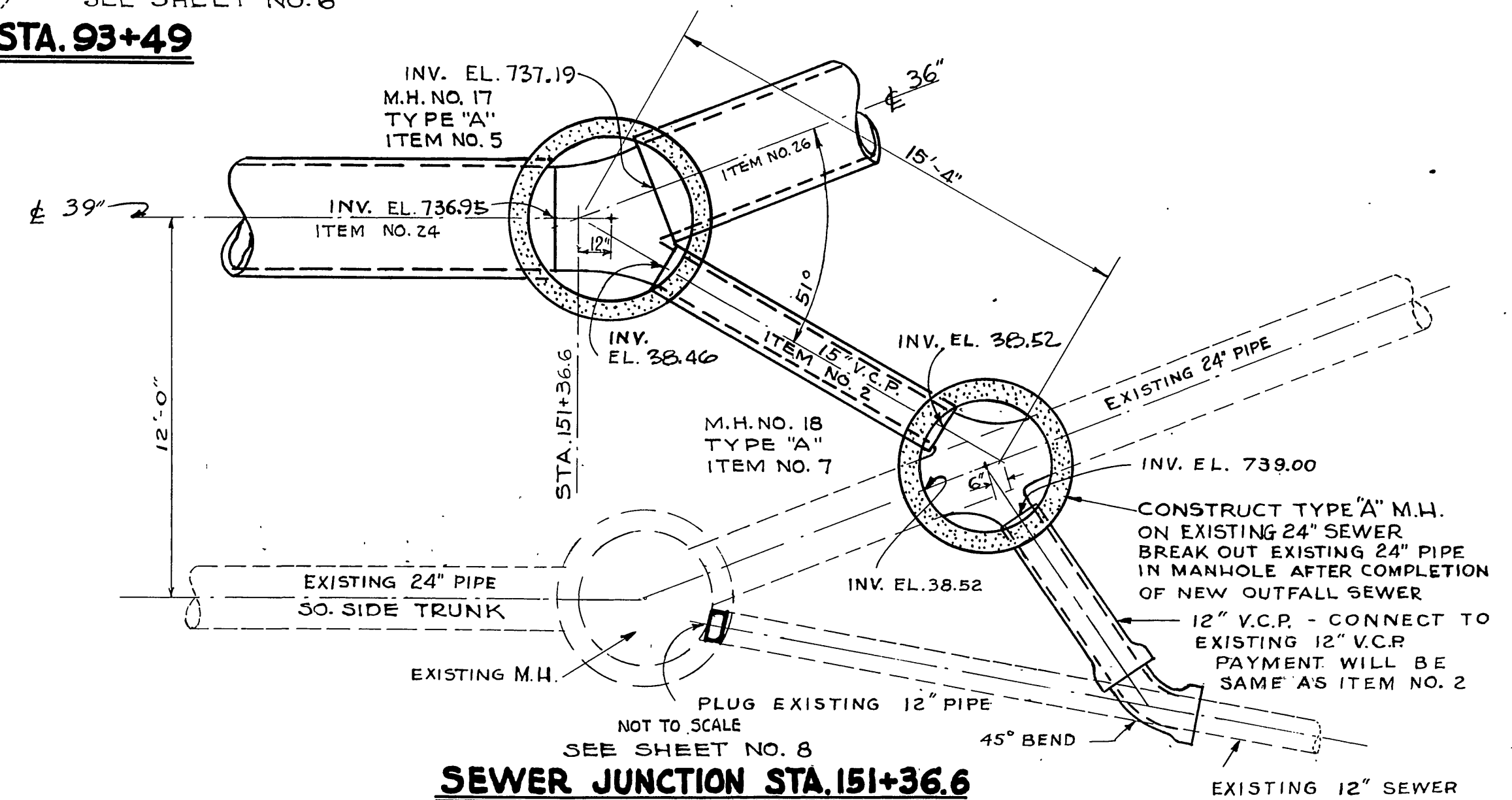
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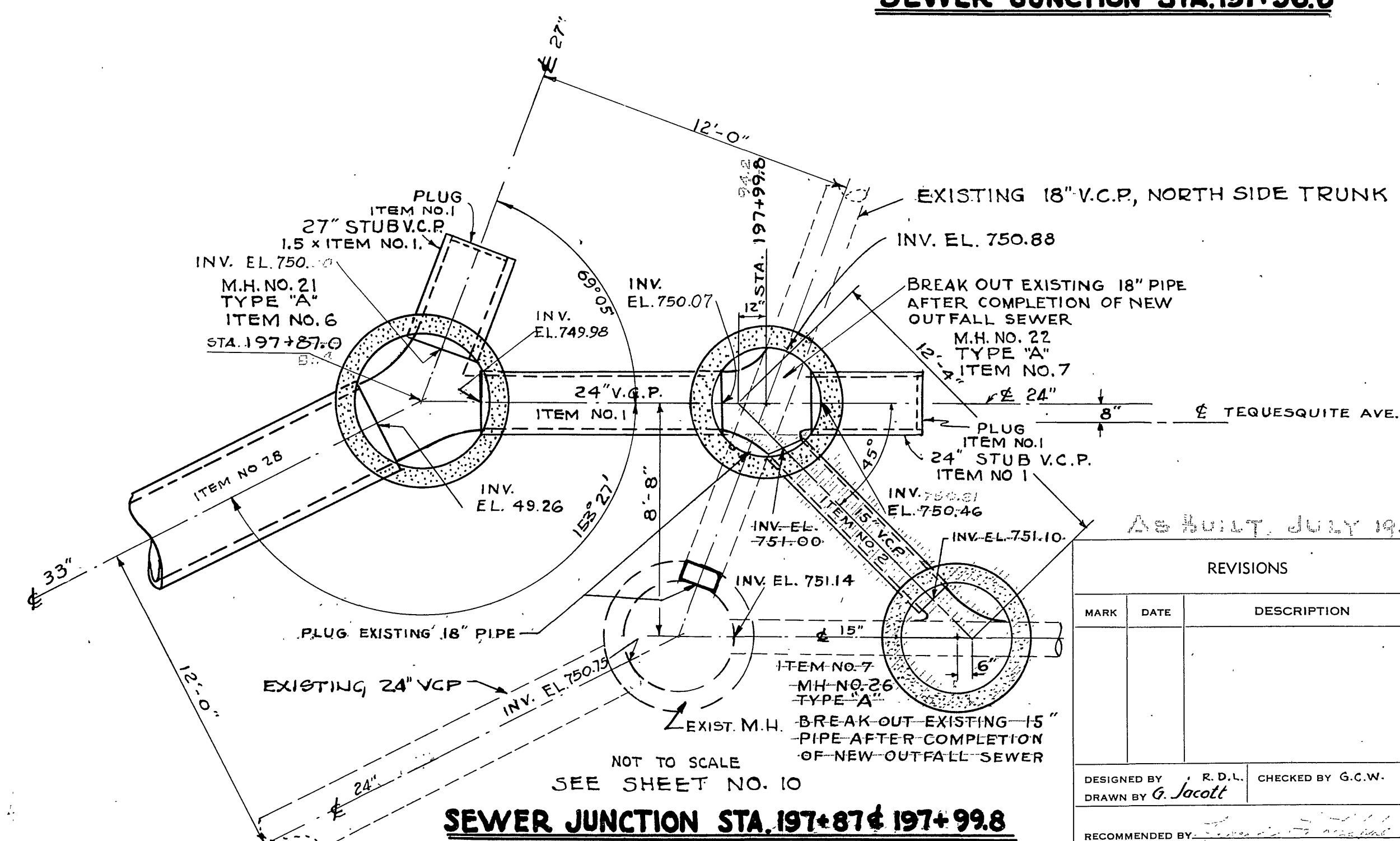
SEWER JUNCTION STA. 1+04.4  
ITEM NO. 10



SEWER JUNCTION STA. 93+49



SEWER JUNCTION STA. 151+36.6



SEWER JUNCTION STA. 197+87 & 197+99.8

TYPICAL HORIZ. STEEL AT CORNERS

APR 17 1959

REVISIONS		DESIGNED BY R. D. A. CHECKED BY G. C. W.	APPROVED BY <i>[Signature]</i> DIRECTOR OF PUBLIC WORKS
MARK	DATE		

JOHN A. CAROLLO  
CONSULTING ENGINEERS  
PHOENIX, ARIZONA

CITY OF RIVERSIDE, CALIFORNIA  
DEPARTMENT OF PUBLIC WORKS

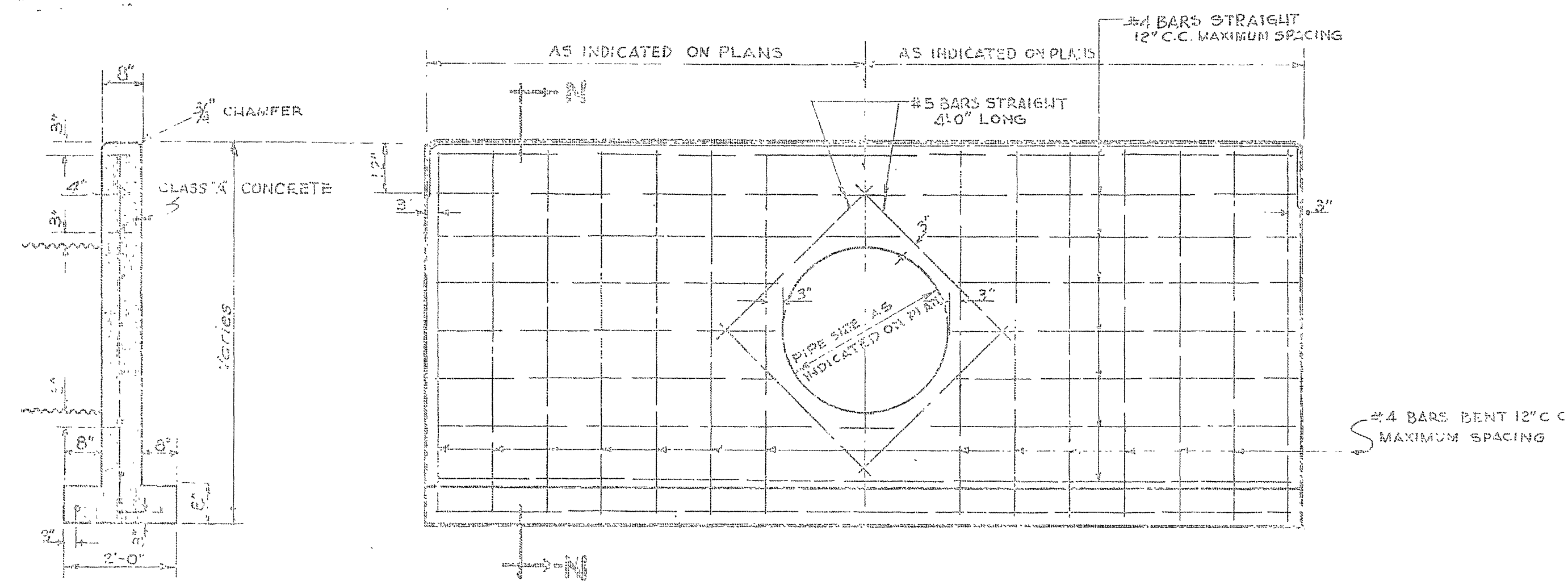
**SANTA ANA OUTFALL  
DETAILS  
OF SEWER JUNCTION  
MANHOLES**

RECOMMENDED BY: *[Signature]* ASSISTANT CITY ENGINEER

DATE: 7-1-59

SHEET 11 OF 15

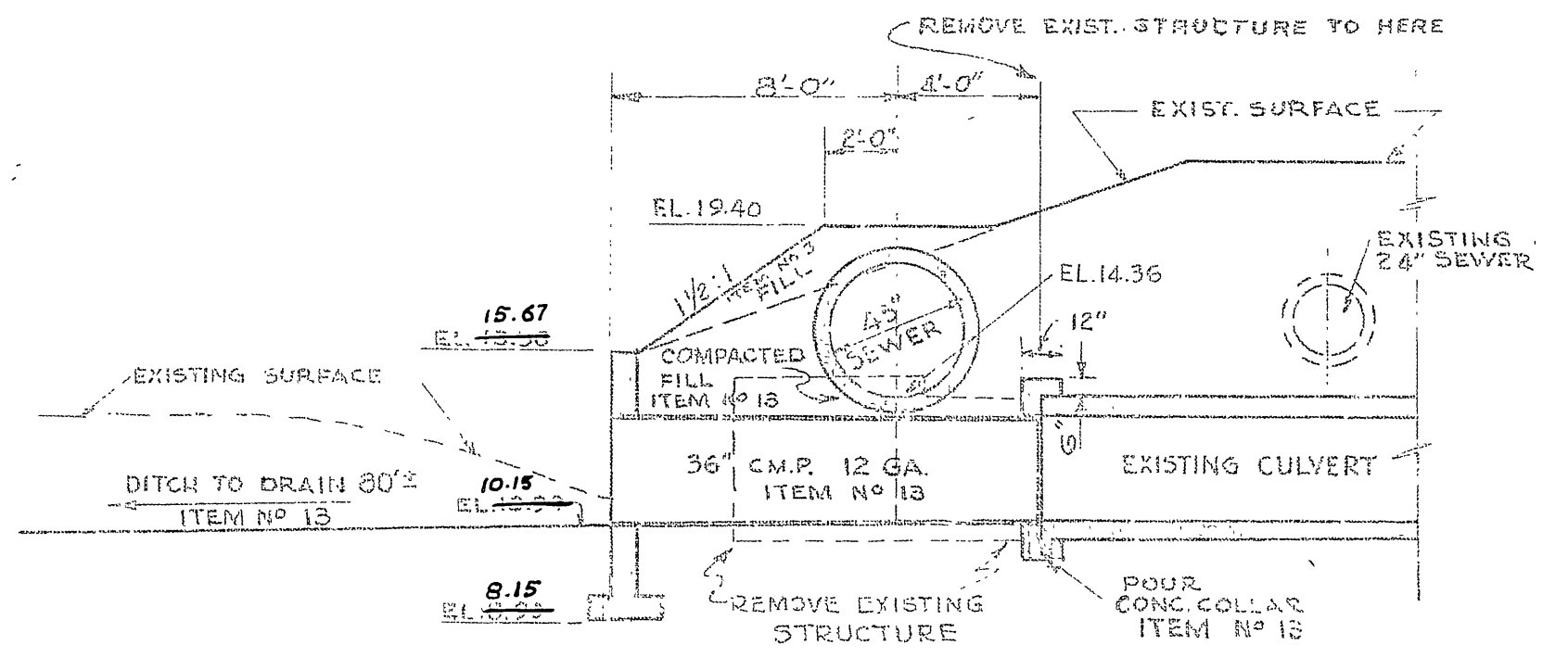




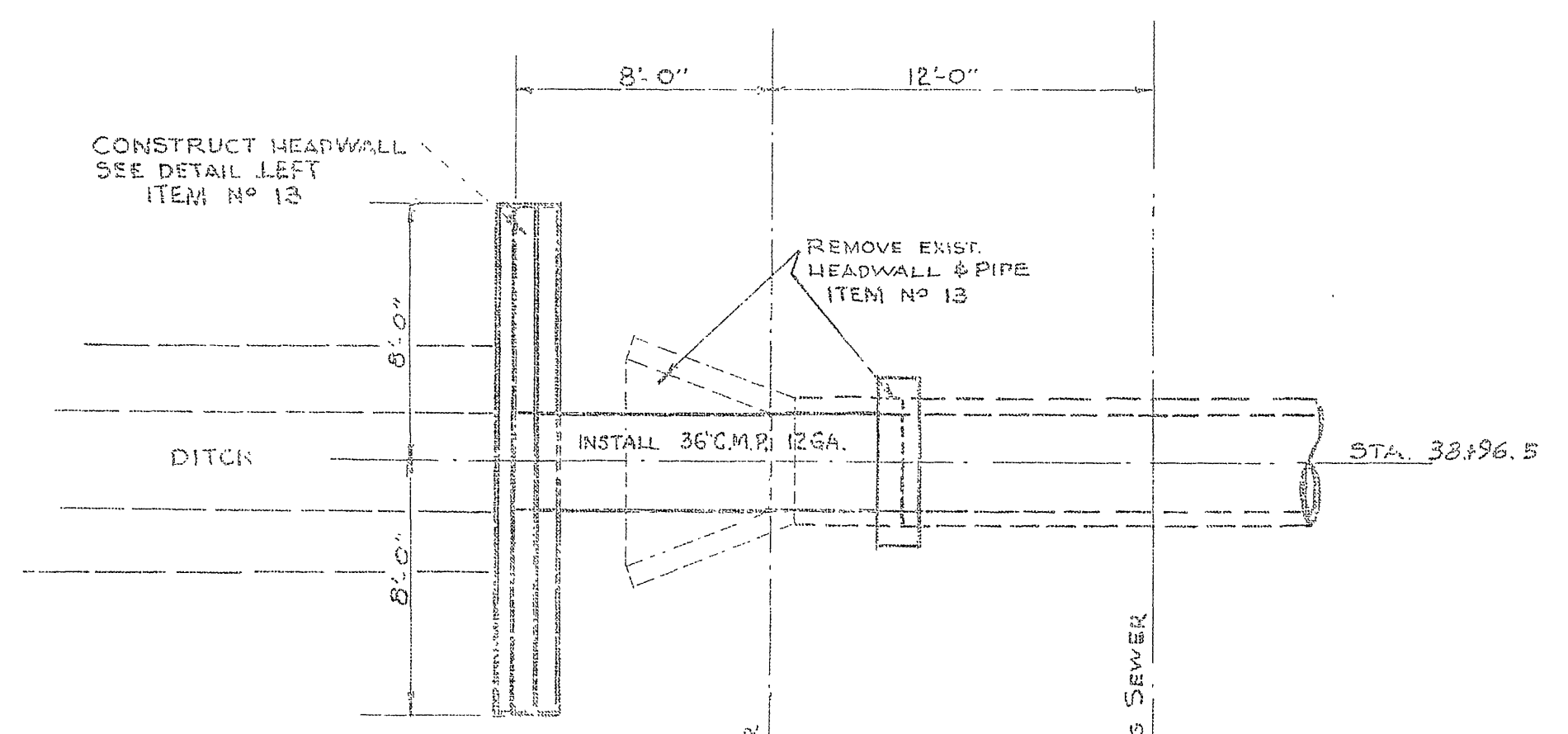
SECTION "N-N"

**TYPICAL HEADWALL DETAIL**

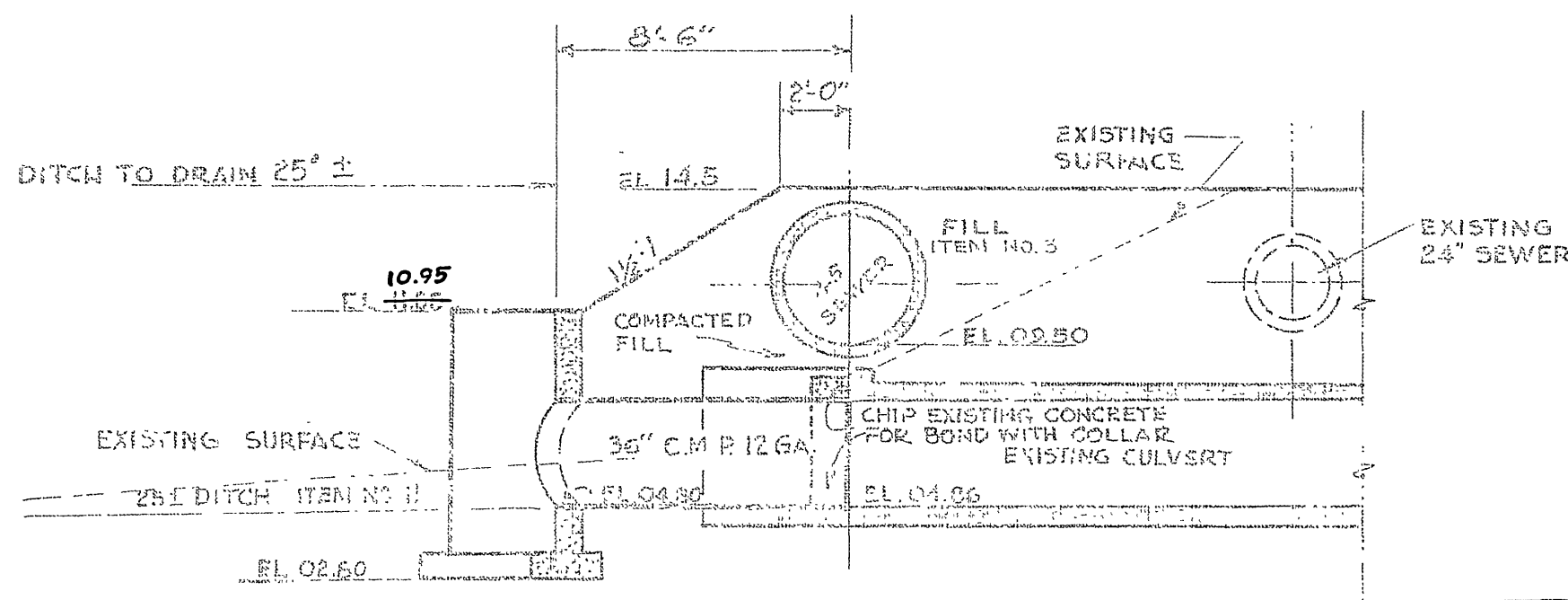
NOTE: ALL CONC. COLLARS TO BE CLASS "A" CONCRETE.



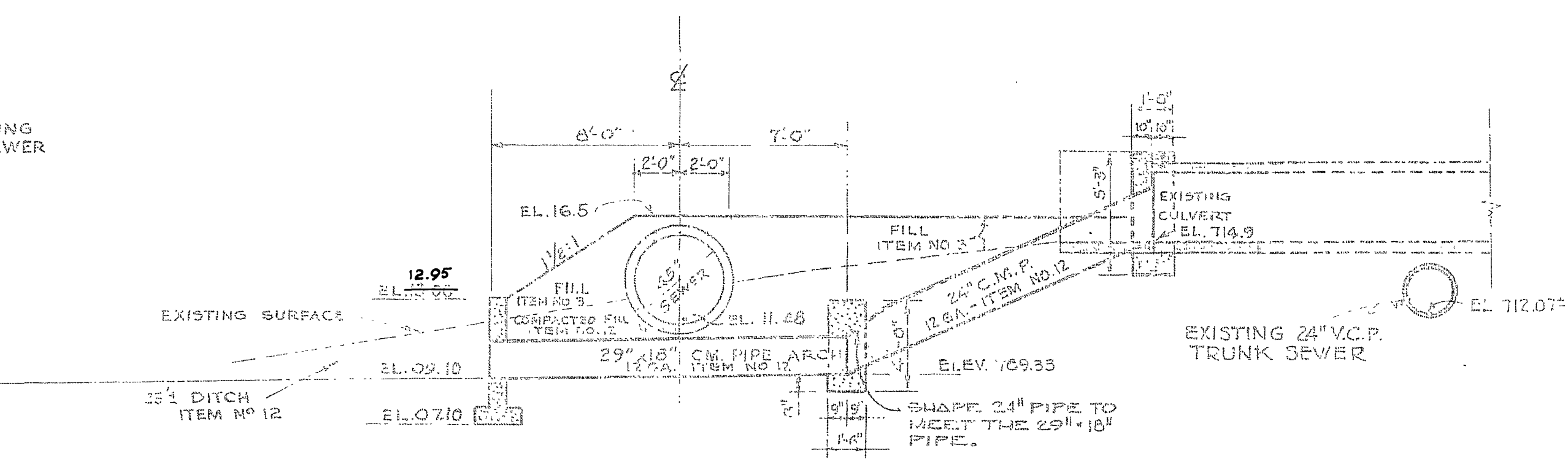
SECTION ON  $\phi$  OF CULVERT



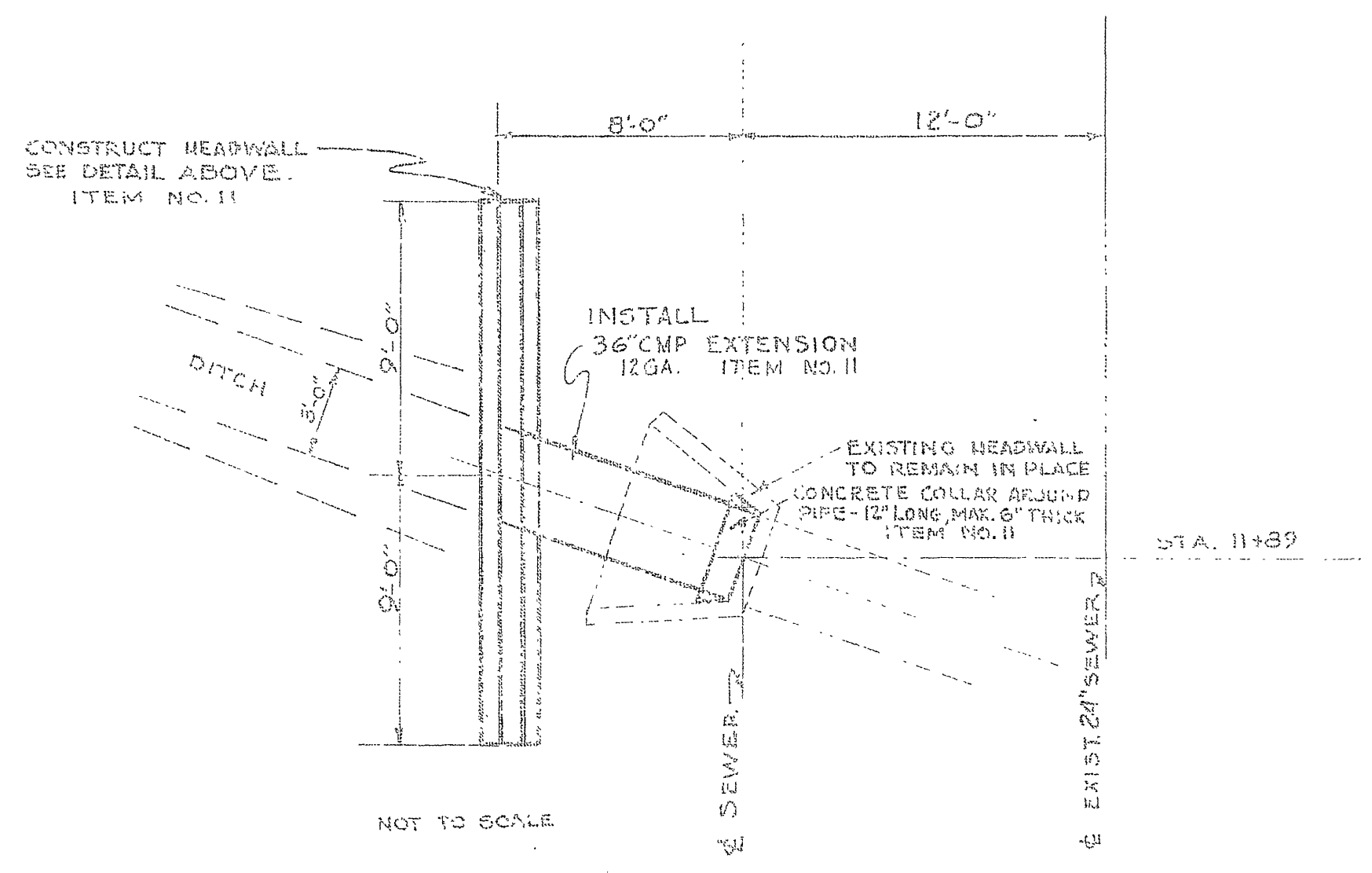
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SEE SHEET NO. 4  
**DRAINAGE STRUCTURE STA. 38+96.5**  
ITEM NO. 13



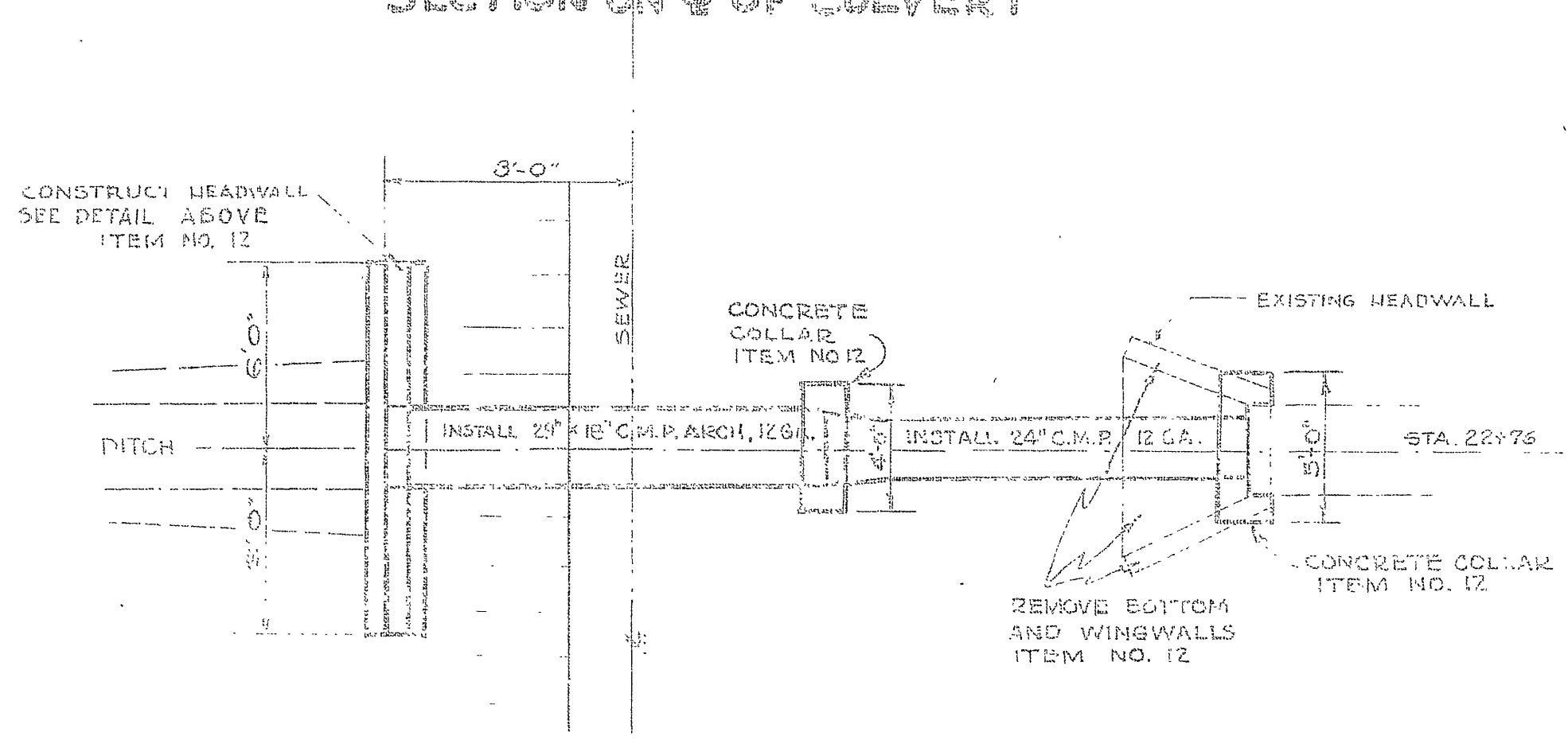
SECTION ON  $\phi$  OF CULVERT



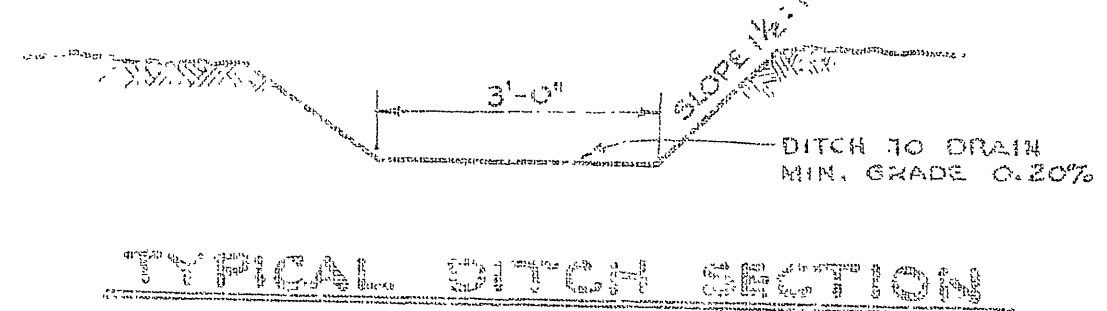
SECTION ON  $\phi$  OF CULVERT



NOT TO SCALE  
SEE SHEET NO. 3  
**DRAINAGE STRUCTURE STA. 11+89**  
ITEM NO. 11



PLAN  
NOT TO SCALE  
SEE SHEET NO. 3  
**DRAINAGE STRUCTURE STA. 22+75**  
ITEM NO. 12

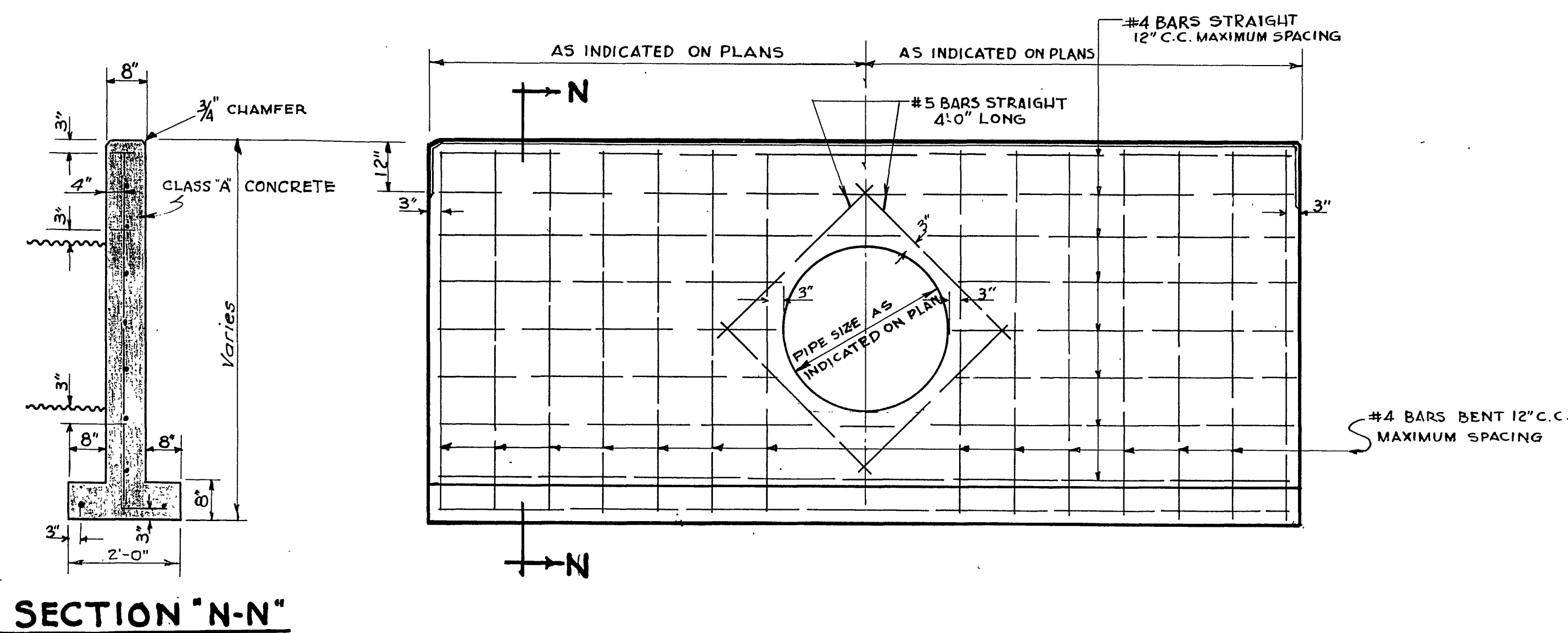


**TYPICAL DITCH SECTION**

AS BUILT, JULY 1959

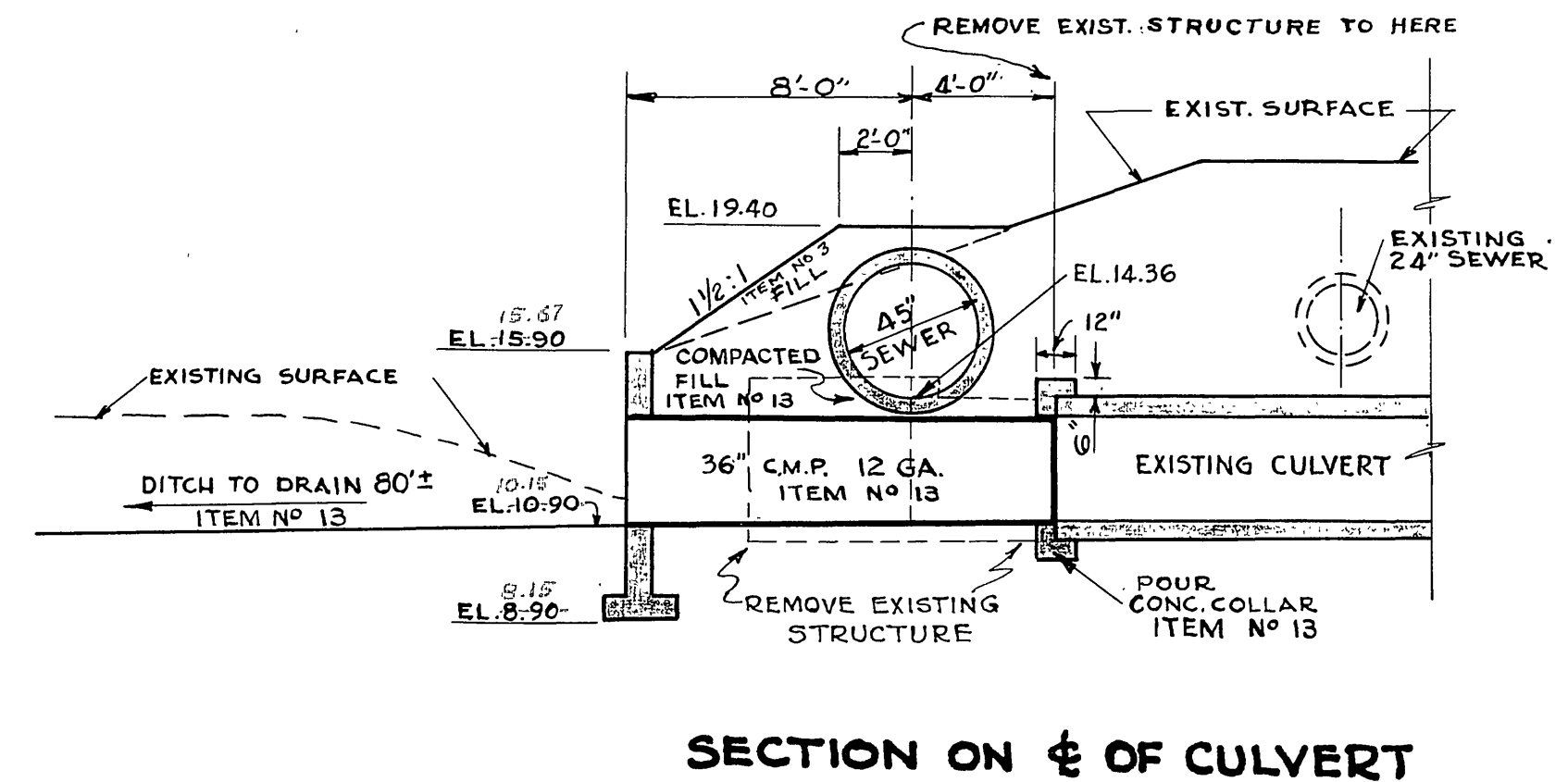
REVISIONS		CITY OF RIVERSIDE, CALIFORNIA DEPARTMENT OF PUBLIC WORKS
MARK	DATE	
		<b>SANTA ANA OUTFALL DRAINAGE STRUCTURES</b>
DESIGNED BY: S. D. I.	CHECKED BY: G. C. W.	DESIGNED BY: <i>Francis J. Lopez</i> CHECKED BY: <i>John A. Carollo</i> DATE: 9-30-57
		PROJECT NO. <b>S-101</b> SHEET NO. 13 OF 15 DATE: 9-30-57



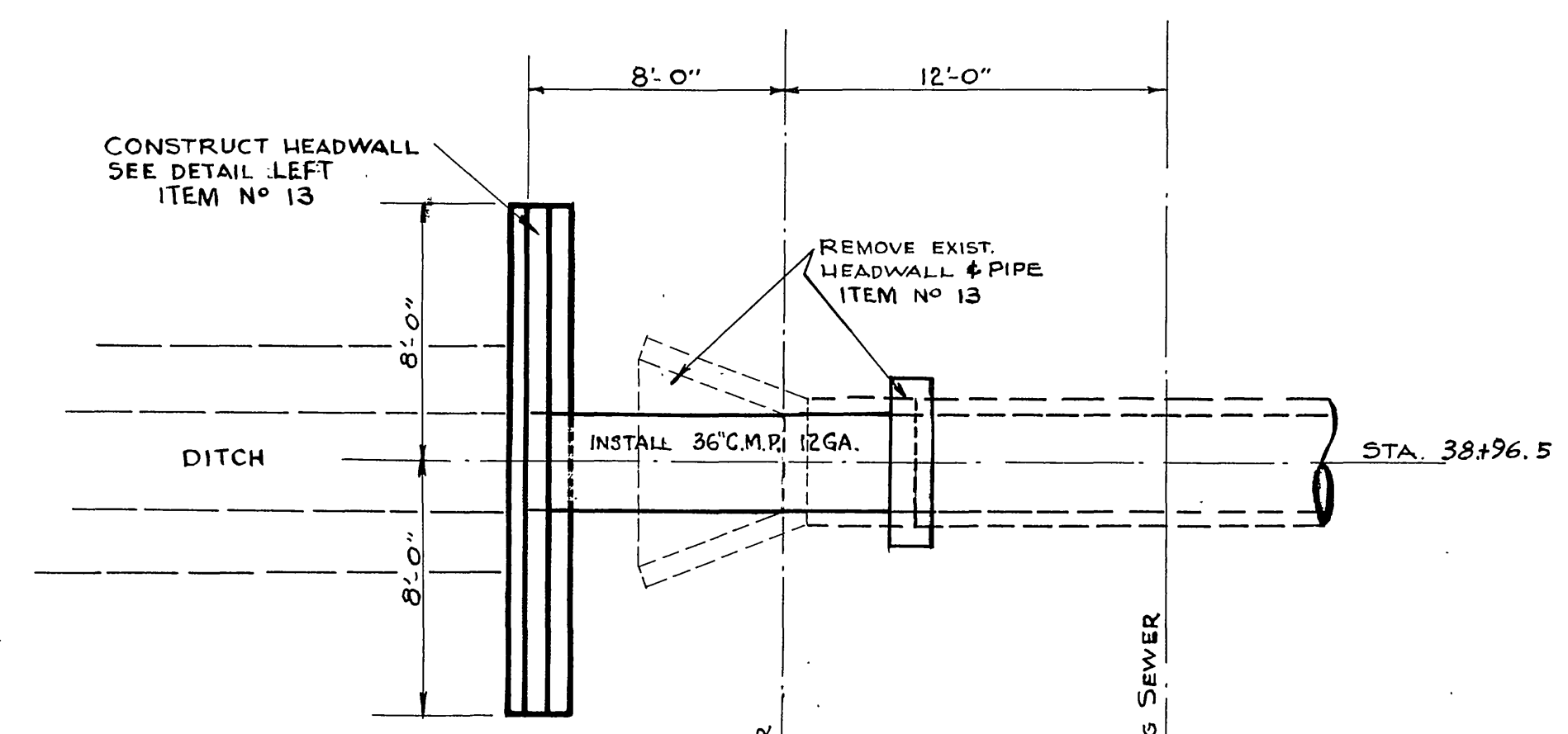


TYPICAL HEADWALL DETAIL

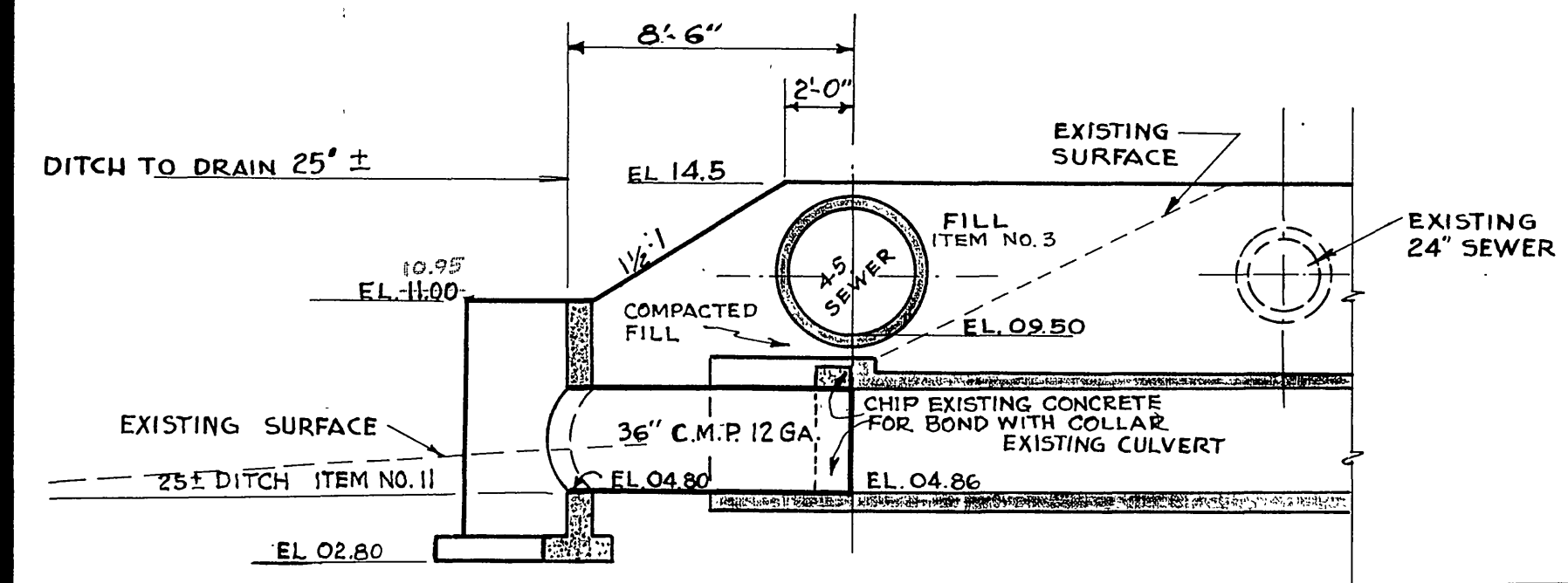
NOTE: ALL CONC. COLLARS TO BE CLASS "A" CONCRETE.



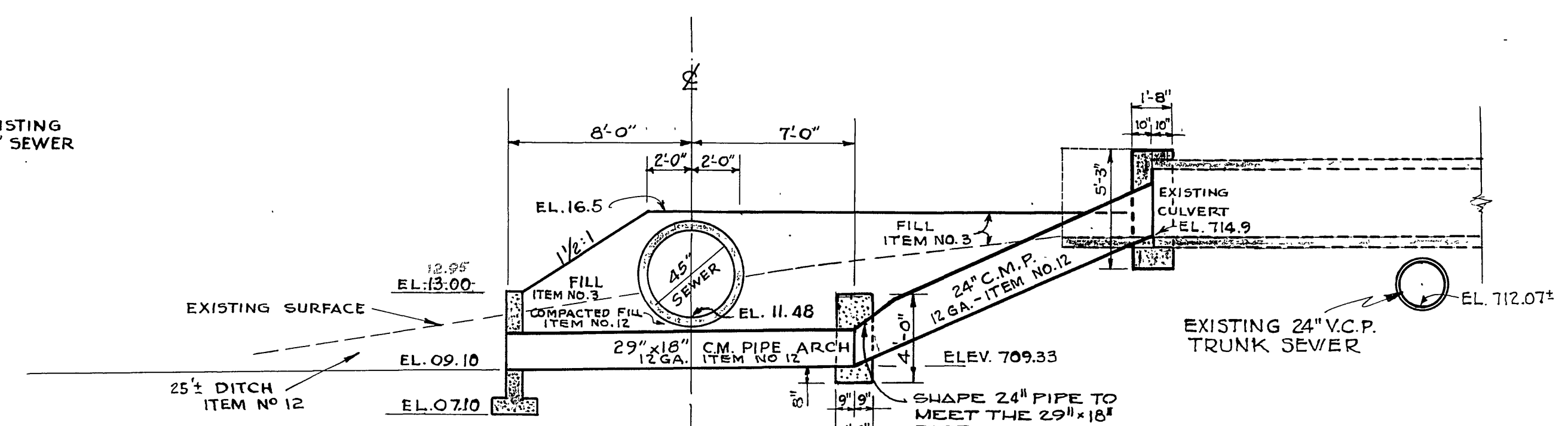
SECTION ON CENTERLINE OF CULVERT



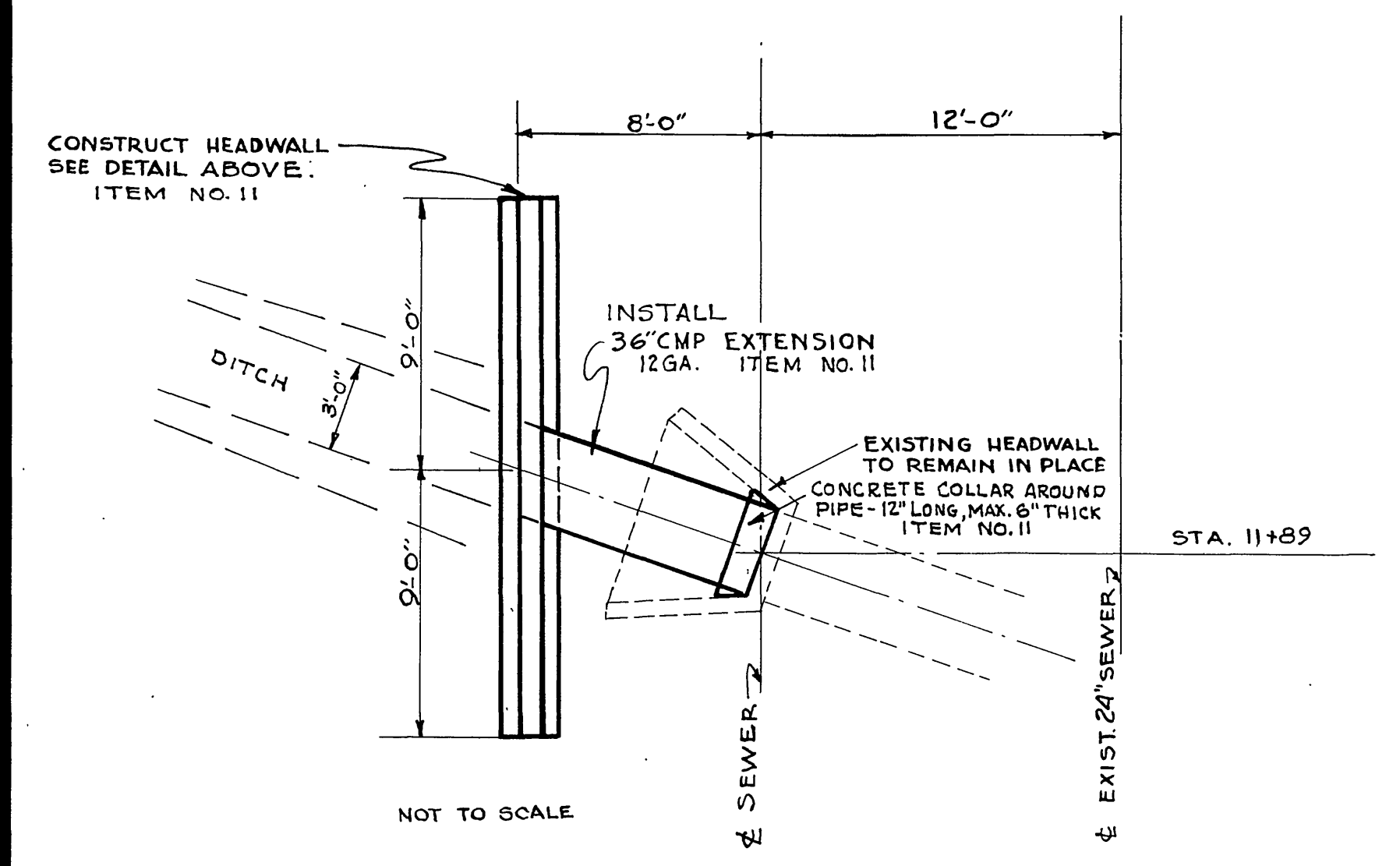
DRAINAGE STRUCTURE STA. 38+96.5



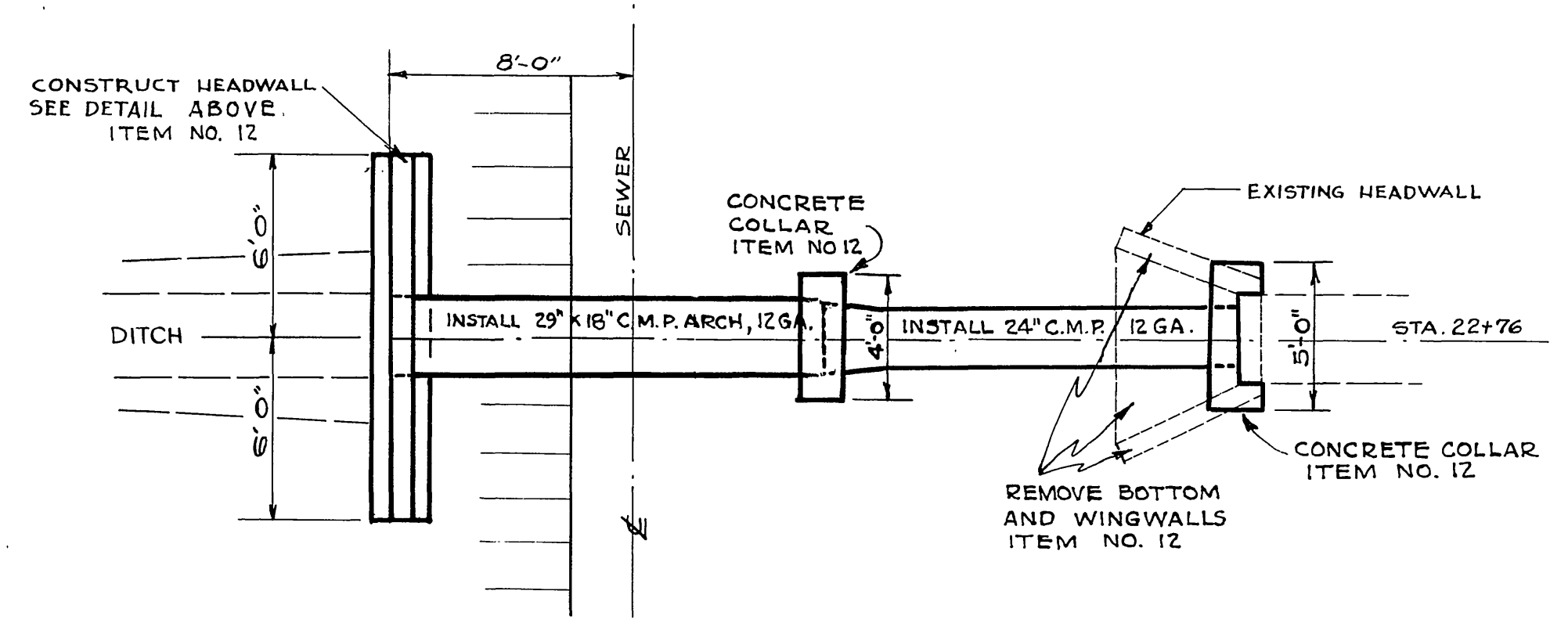
SECTION ON CENTERLINE OF CULVERT



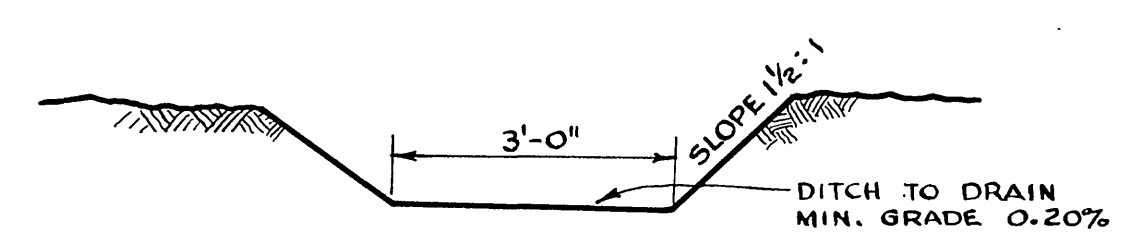
SECTION ON CENTERLINE OF CULVERT



DRAINAGE STRUCTURE STA. 11+89



DRAINAGE STRUCTURE STA. 22+76



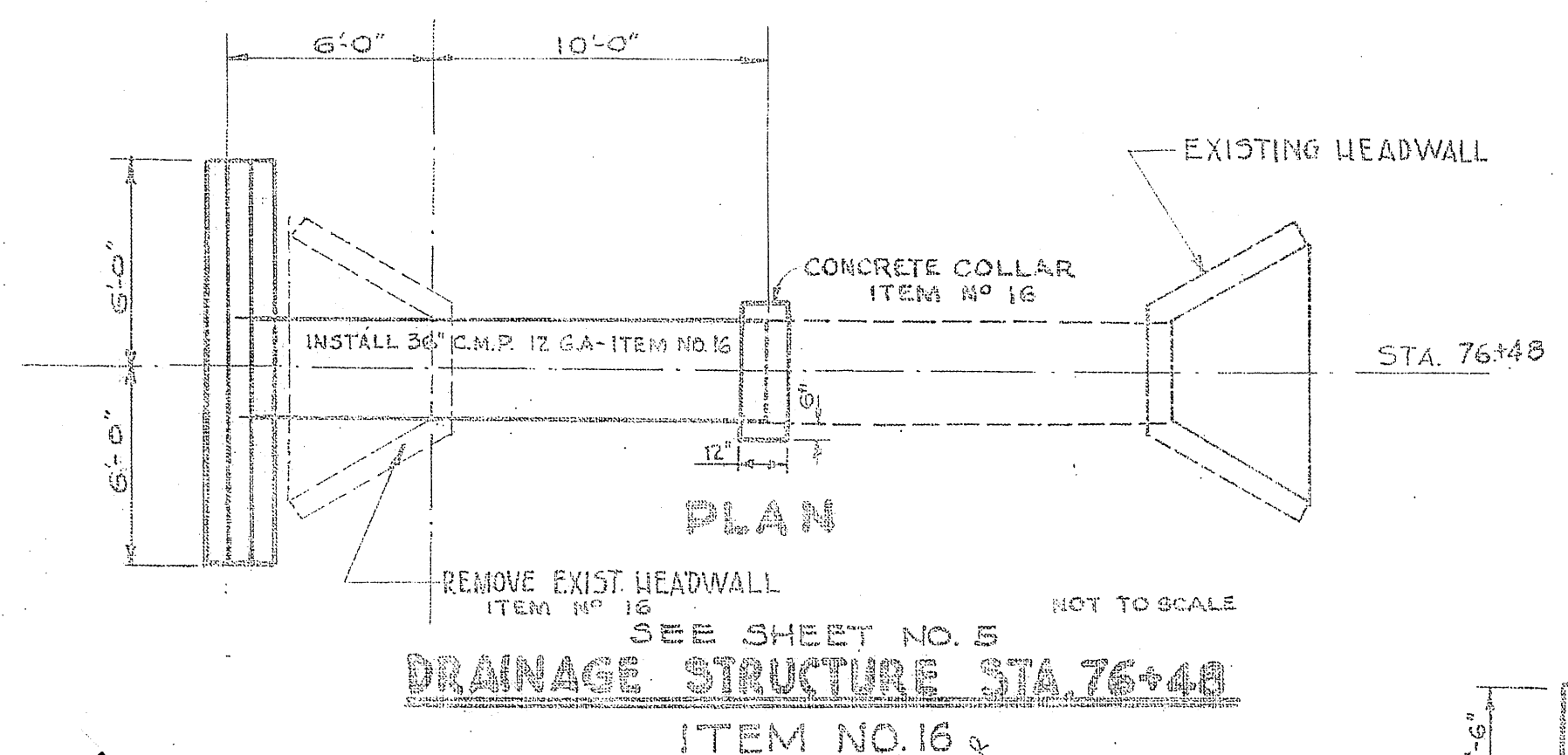
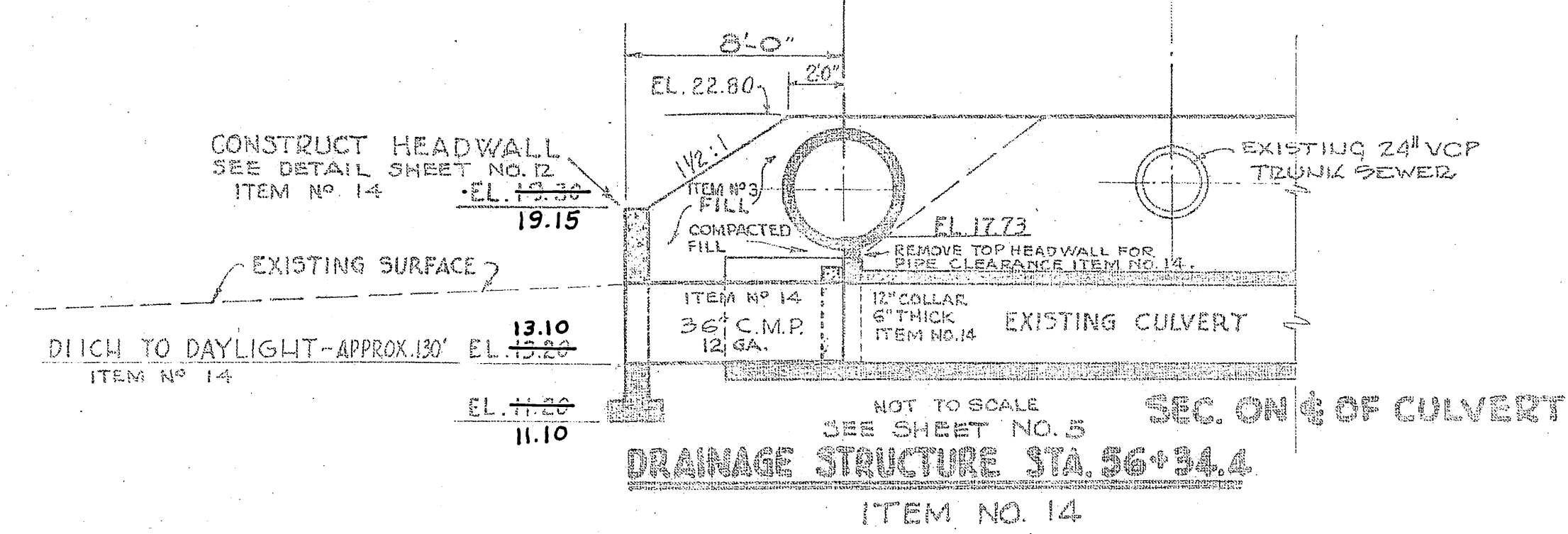
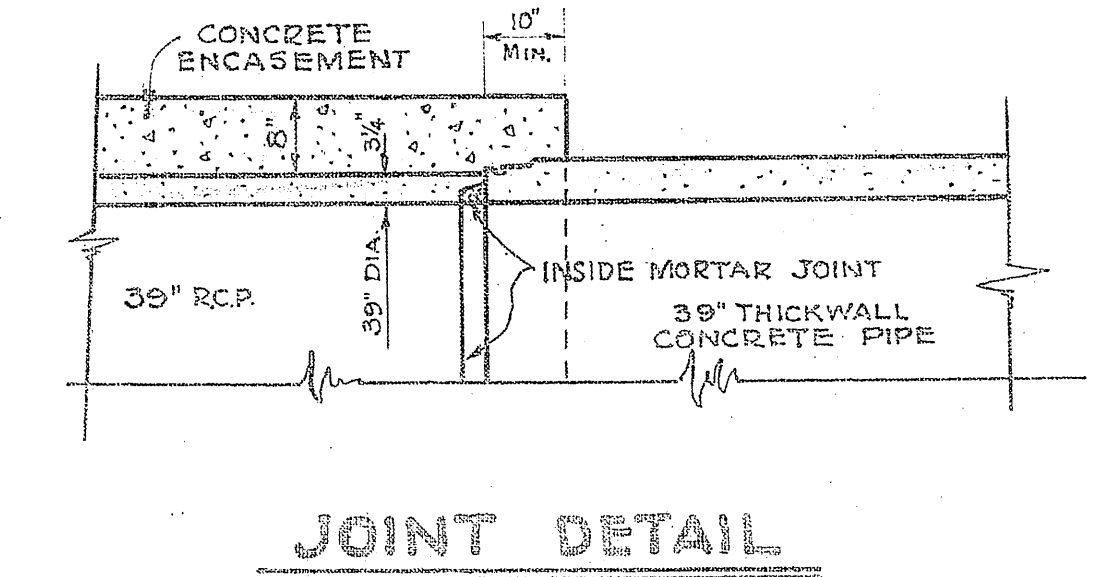
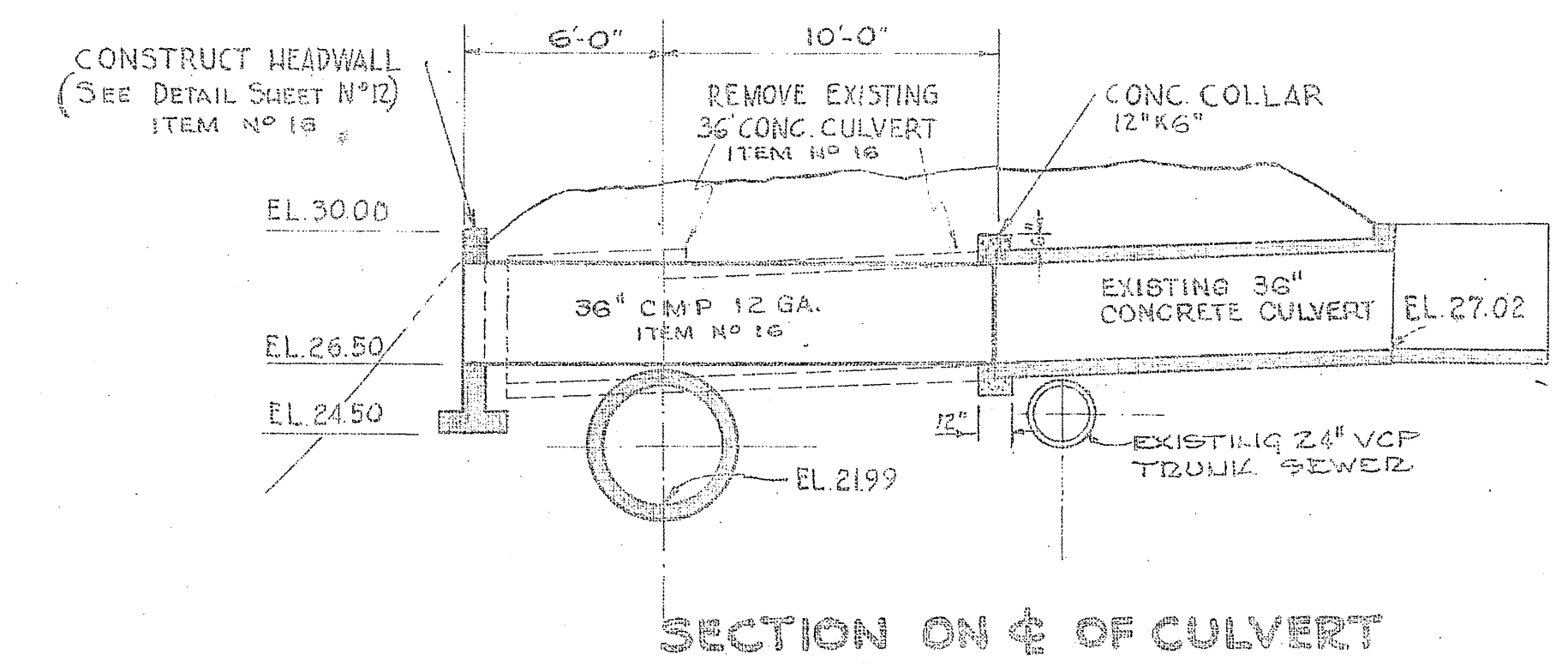
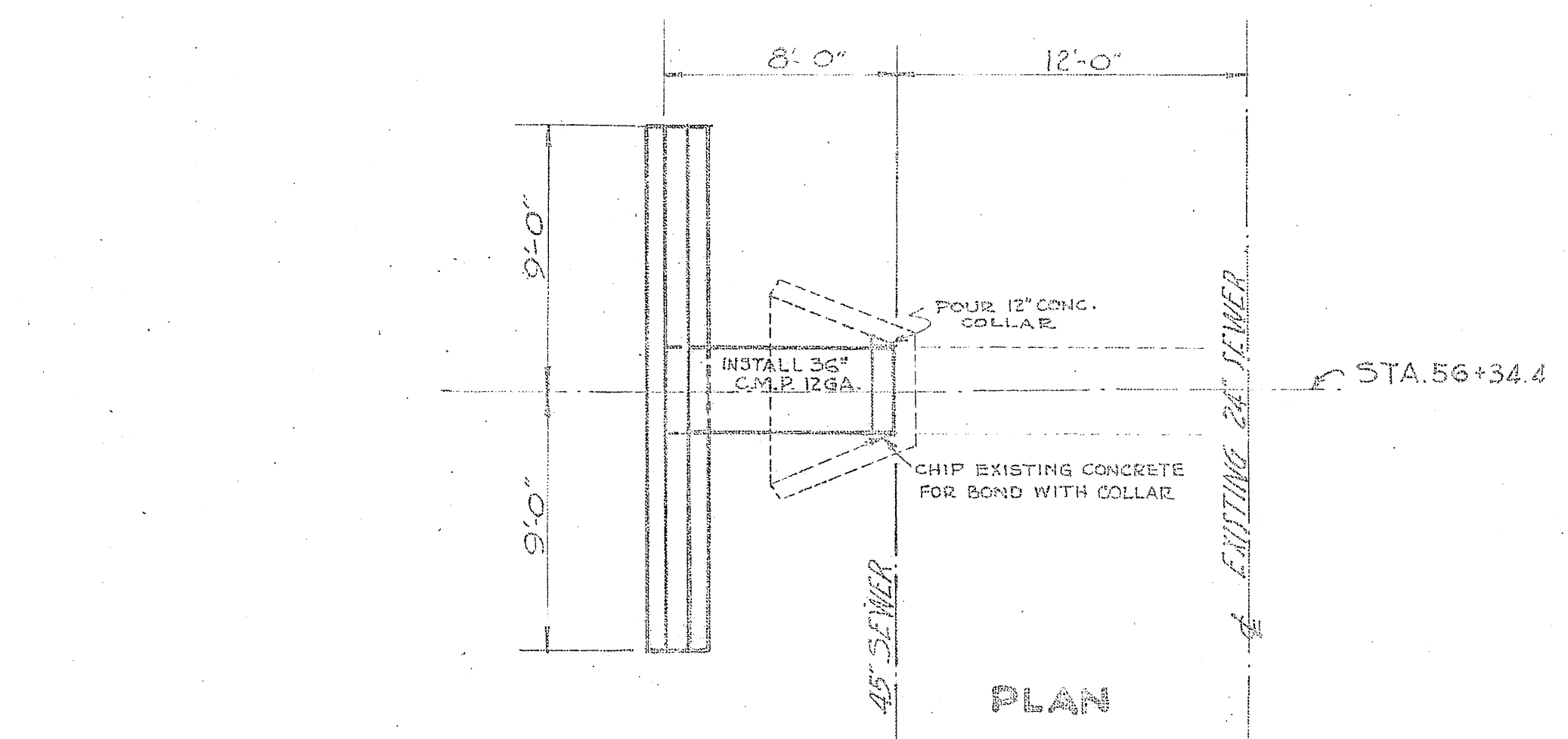
TYPICAL DITCH SECTION

AS BUILT, JULY 1959

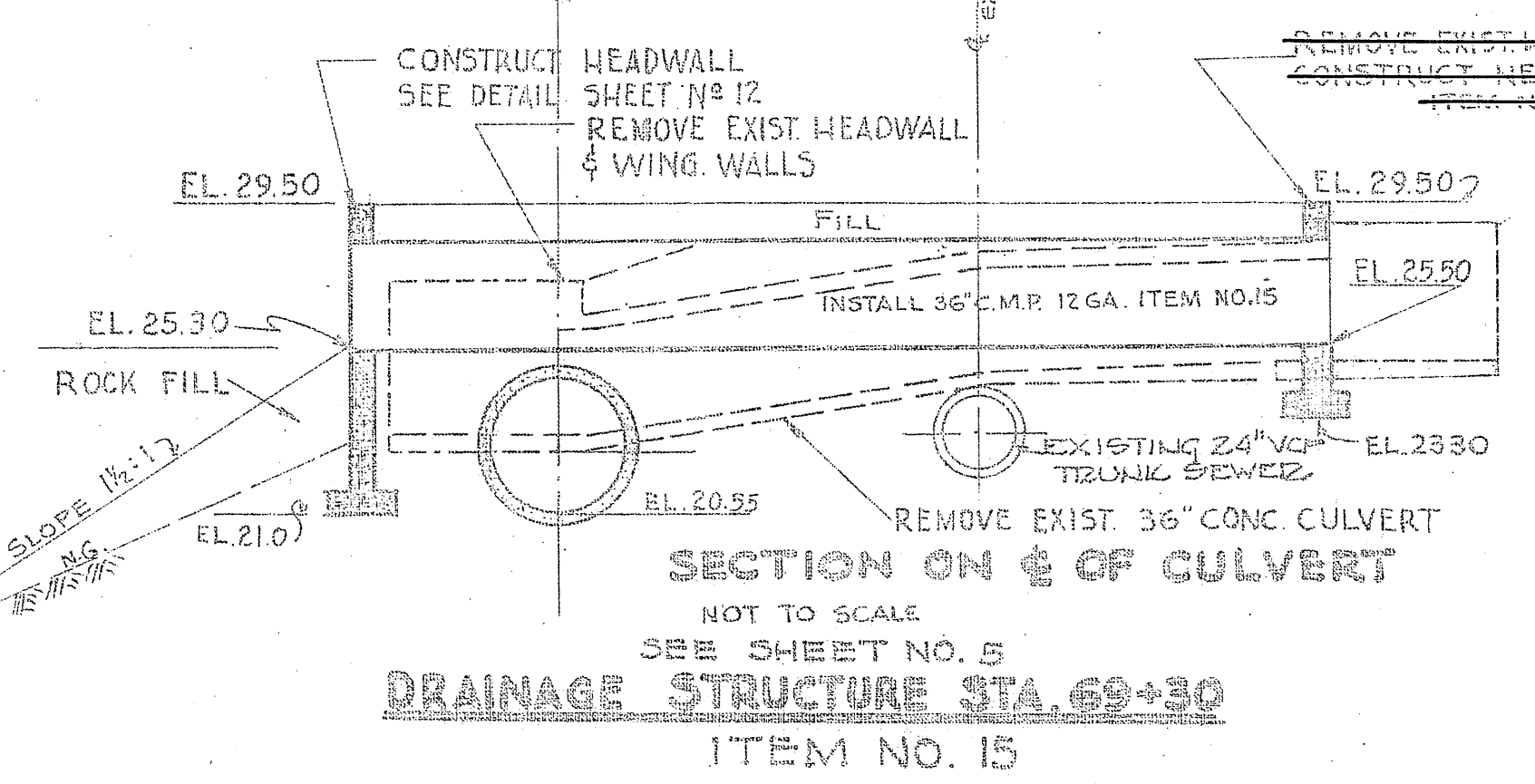
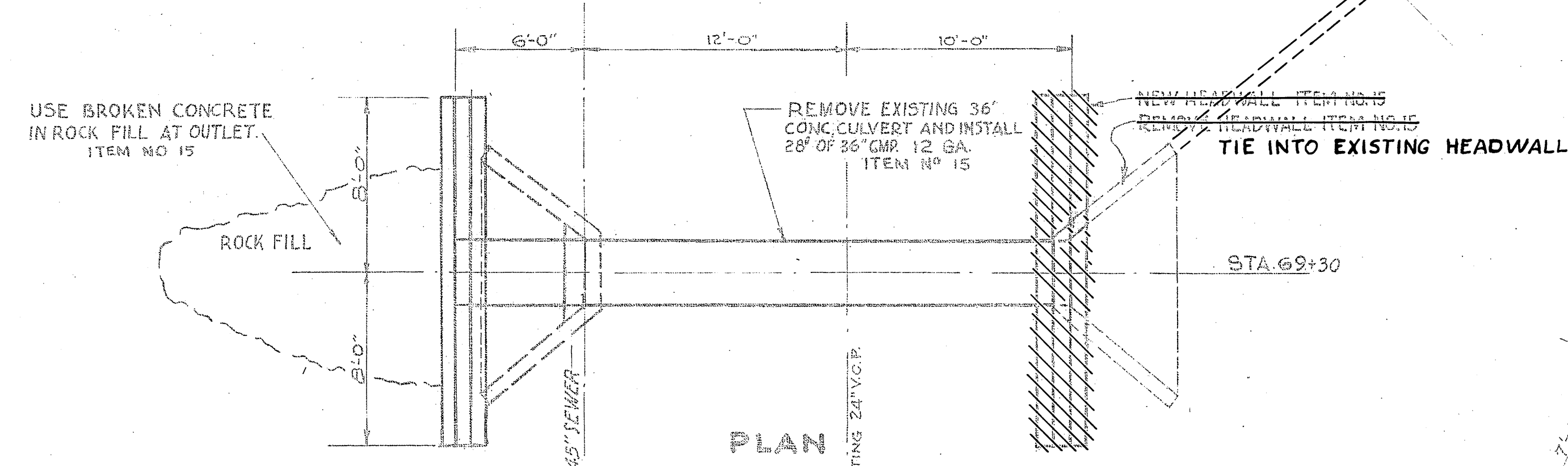
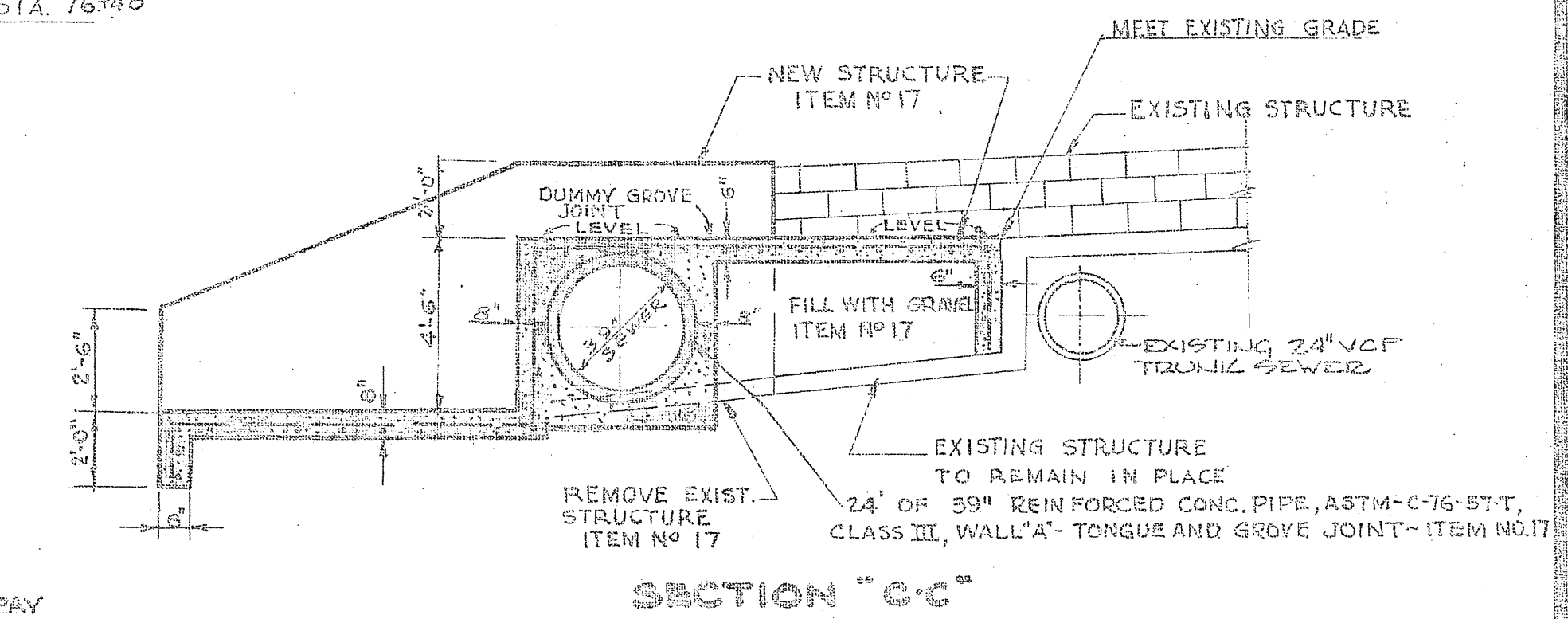
REVISIONS			DESIGNED BY R. D. L. DRAWN BY G. Scott	CHECKED BY G. C. W.	APPROVED BY DIRECTOR OF PUBLIC WORKS
MARK	DATE	DESCRIPTION			

JOHN A. CAROLLO  
CONSULTING ENGINEERS  
PHOENIX, ARIZONA  
CITY OF RIVERSIDE, CALIFORNIA  
DEPARTMENT OF PUBLIC WORKS  
**SANTA ANA OUTFALL  
DRAINAGE STRUCTURES**  
DATE 7-30-57  
SHEET 12 OF 15

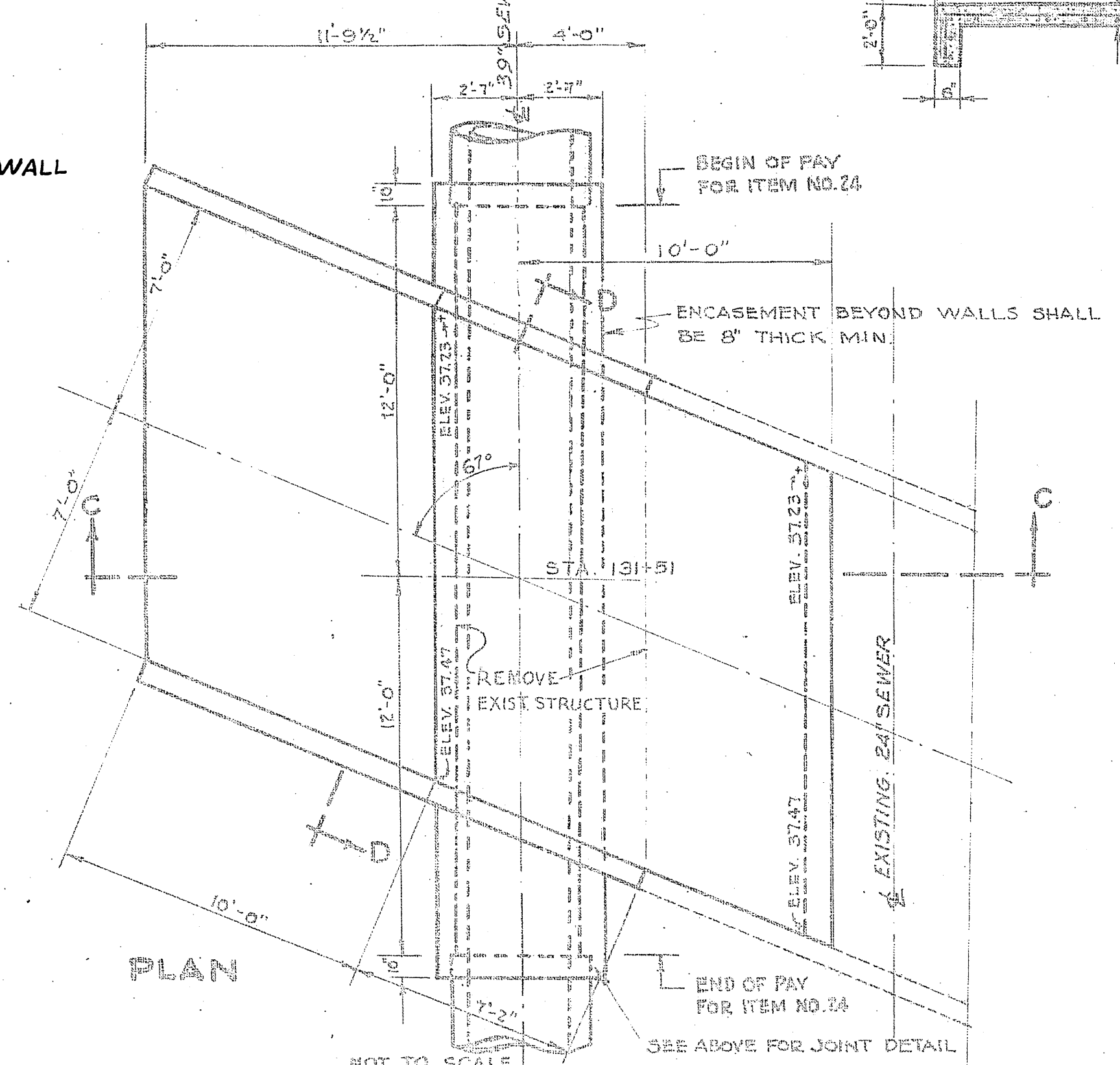




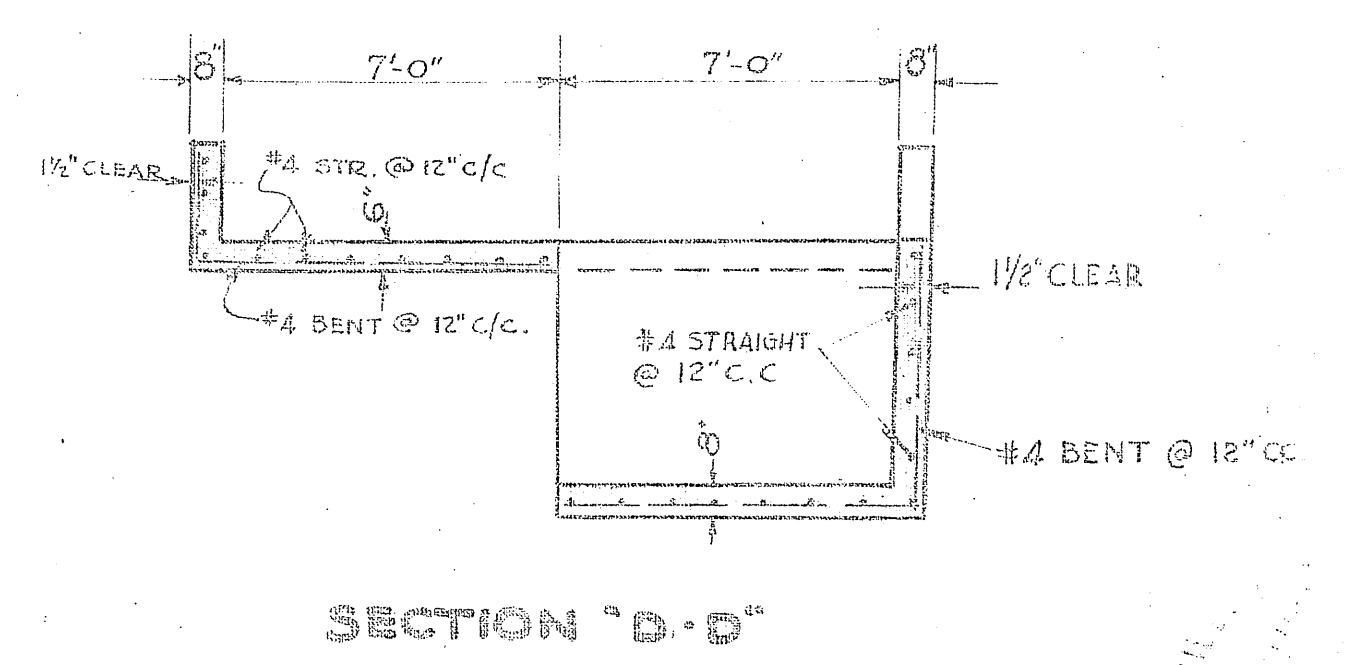
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SEE SHEET NO. 5  
**DRAINAGE STRUCTURE STA. 76+48**  
ITEM NO. 16



NOT TO SCALE  
SEE SHEET NO. 5  
**DRAINAGE STRUCTURE STA. 69+30**  
ITEM NO. 15



NOT TO SCALE  
SEE SHEET NO. 7  
**DRAINAGE STRUCTURE STA. 131+51**  
ITEM NO. 17



AS BUILT, JULY 1959

REVISIONS			APPROVED BY <i>John A. Carollo</i>
MARK	DATE	DESCRIPTION	

DESIGNED BY: E.D.L.  
DRAWN BY: G. Jacobi  
CHECKED BY: G.C.W.  
RECOMMENDED BY: *Francis J. Lipp*  
DATE: 9-30-57

JOHN A. CAROLLO  
CONSULTING ENGINEER  
PHOENIX, ARIZONA  
CITY OF RIVERSIDE, CALIFORNIA  
DEPARTMENT OF PUBLIC WORKS

**SANTA ANA OUTFALL  
DRAINAGE STRUCTURES**

**S-101**  
SHEET 13 OF 15  
4105-B-1096





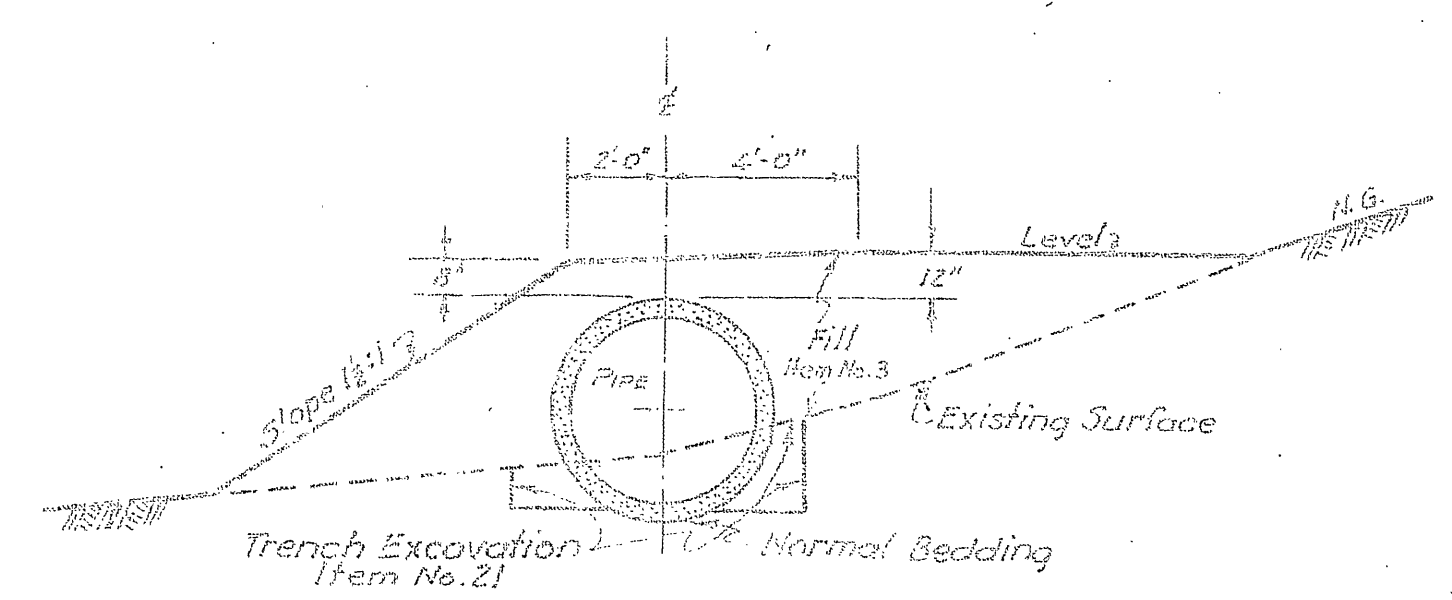




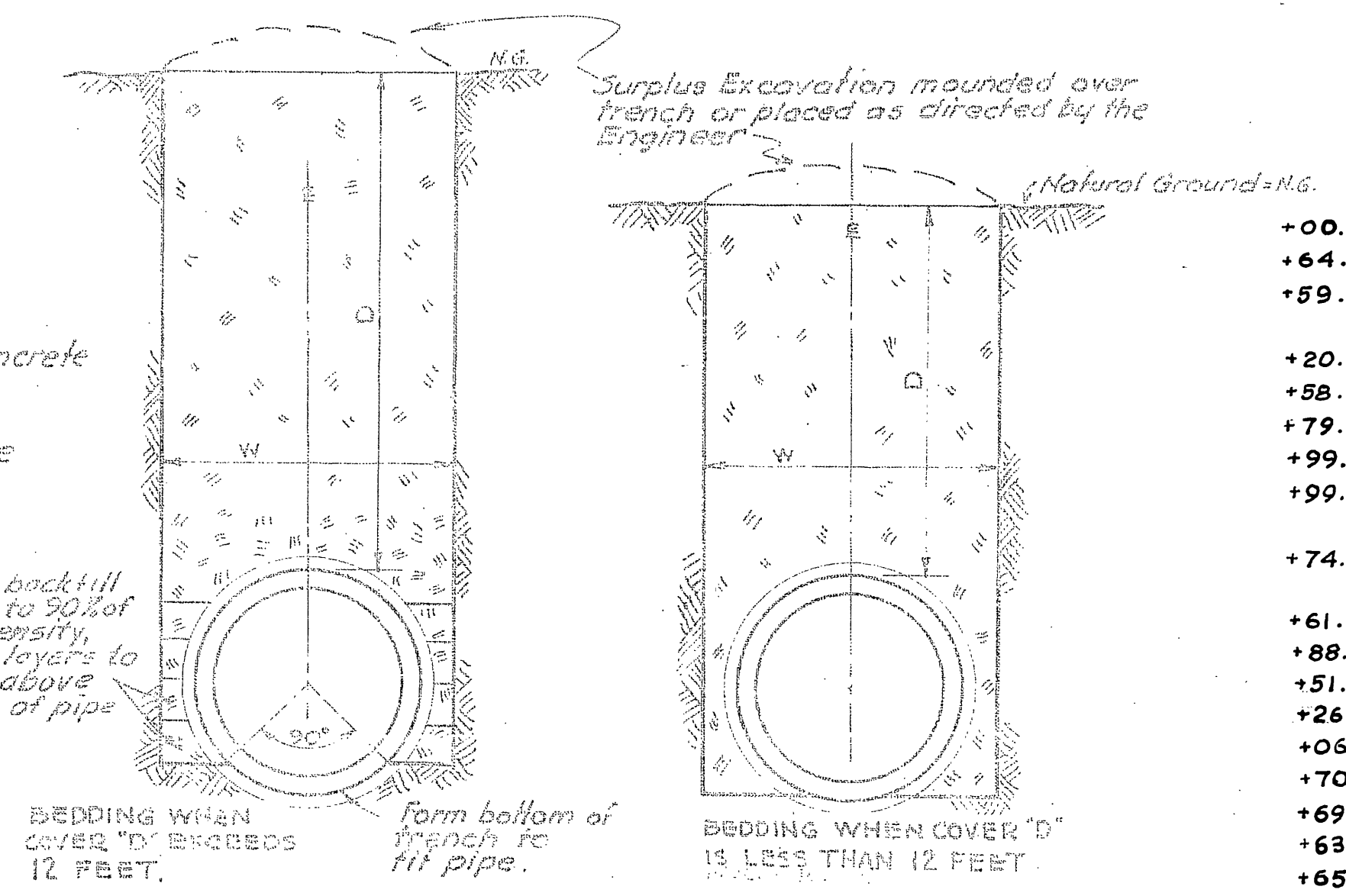
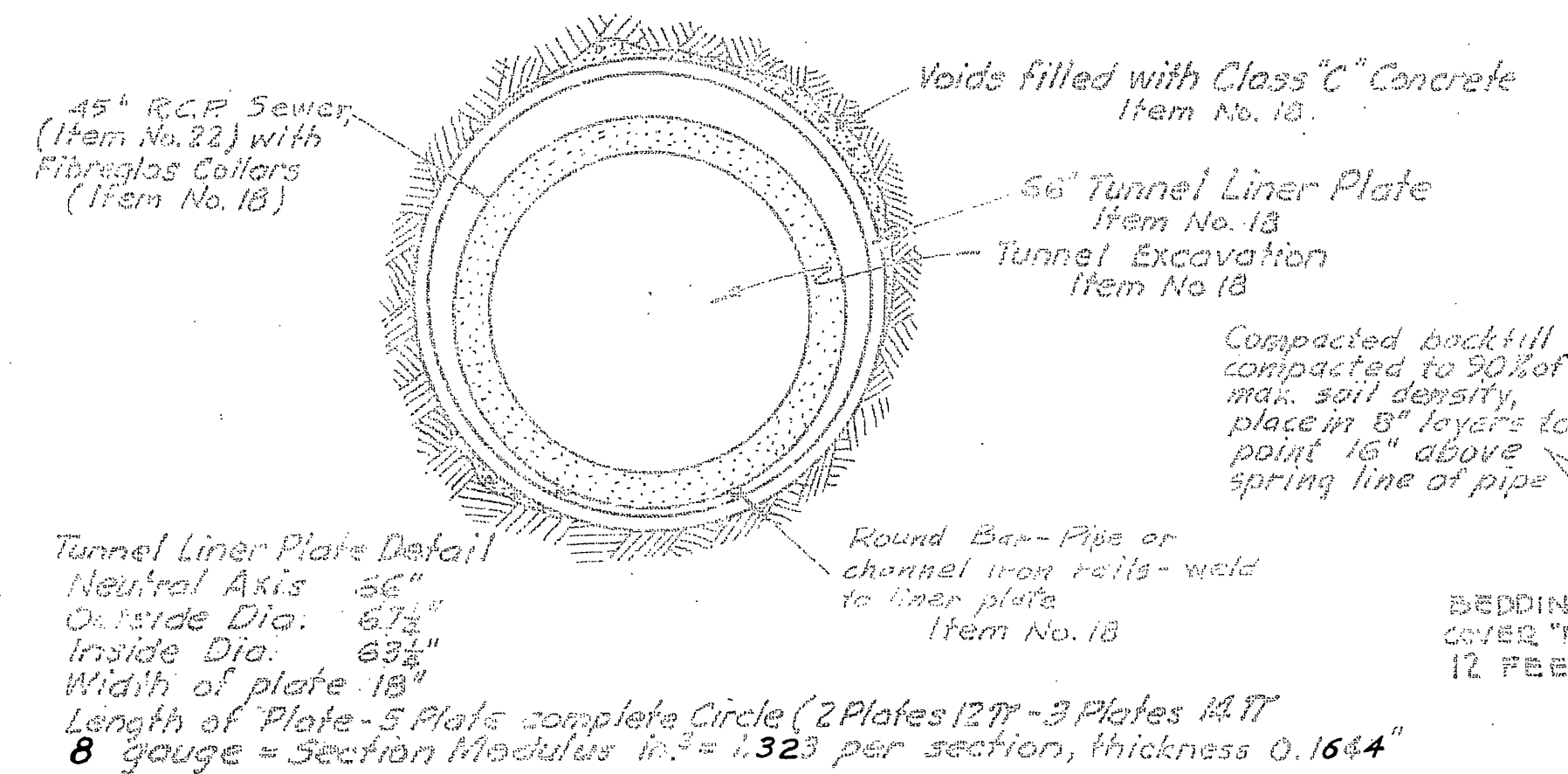








NOT TO SCALE  
**DETAIL OF FILL OVER PIPE WHERE TOP OF PIPE IS ABOVE EXISTING GRADE**  
ITEM NO. 3



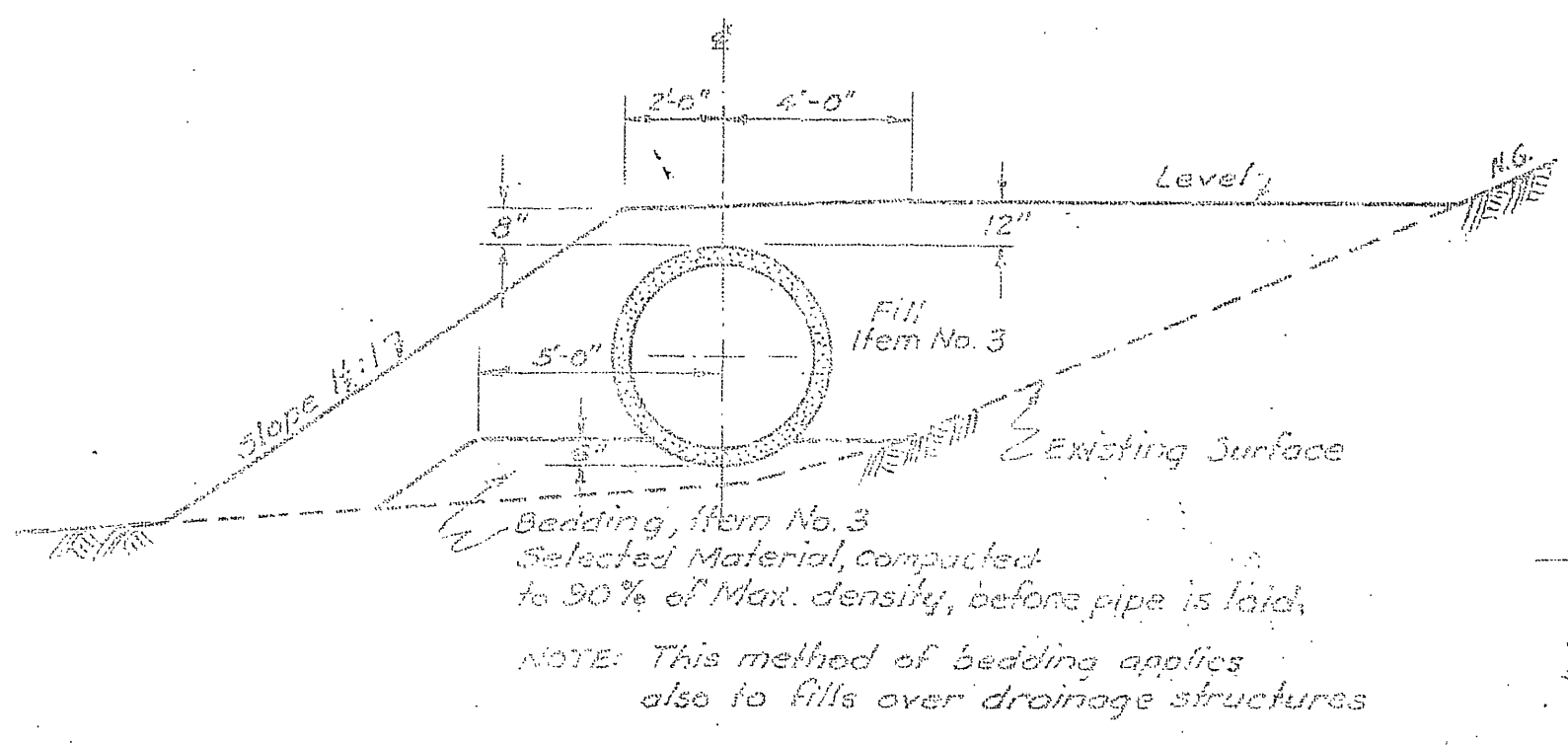
**TABLE FOR TRENCH WIDTH**

I.D. OF PIPE	WIDTH OF TRENCH	
	THICK WALL CONC. PIPE	VITRIFIED CLAY AND PLASTIC LINED CONC. PIPE
45 inch	7'-0"	6'-9"
39 inch	6'-6"	6'-3"
36 inch	6'-2"	5'-11"
33 inch	5'-10"	5'-6"
24 inch		4'-6"
15 inch		3'-0"

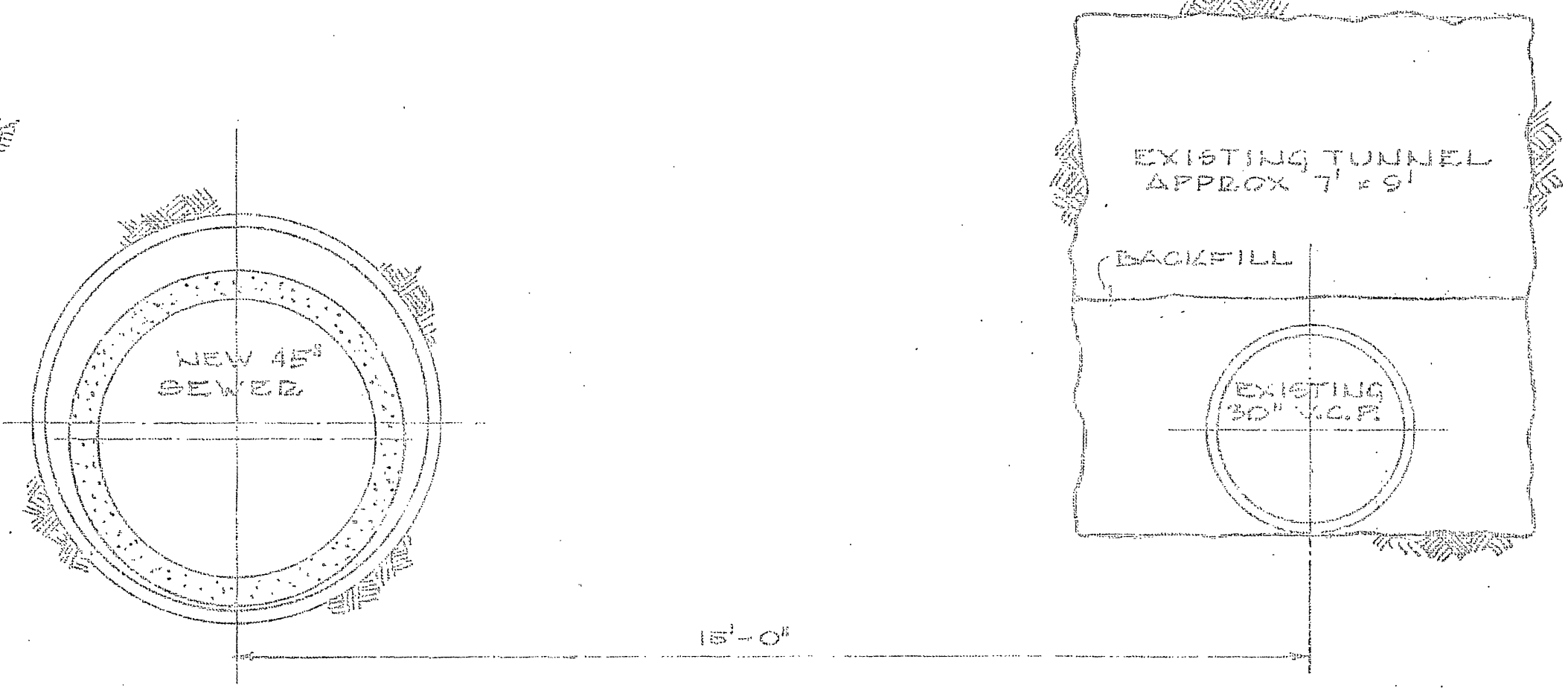
Pay for Item No. 21 is based on max. trench width

**TABLE FOR SPECIAL PIPE ANGLES**

STATION	SIZE	ANGLE
+00.3	1+22.8	45°
+64.8	5+66	45°
+59.7	11+50	45°
+20.0	21+75	45°
+58.7	25+66	45°
+79.3	32+7	45°
+99.7	47+66	45°
+99.7	47+66	45°
+74.8	52+70.1	45°
+61.5	53+6	45°
+88.4	56+08.1	45°
+51.6	58+6	45°
+26.1	66+20	45°
+06.6	84+6	39°
+70.1	92+6	39°
+69.9	99+6	39°
+63.5	109+6	39°
+65.4	116+6	39°
+11.3	131+6	39°
+80.3	135+6	39°
+97.8	138+71.75	39°
+32.4	140+6	39°
+63.9	142+6	39°
	154+6	36°

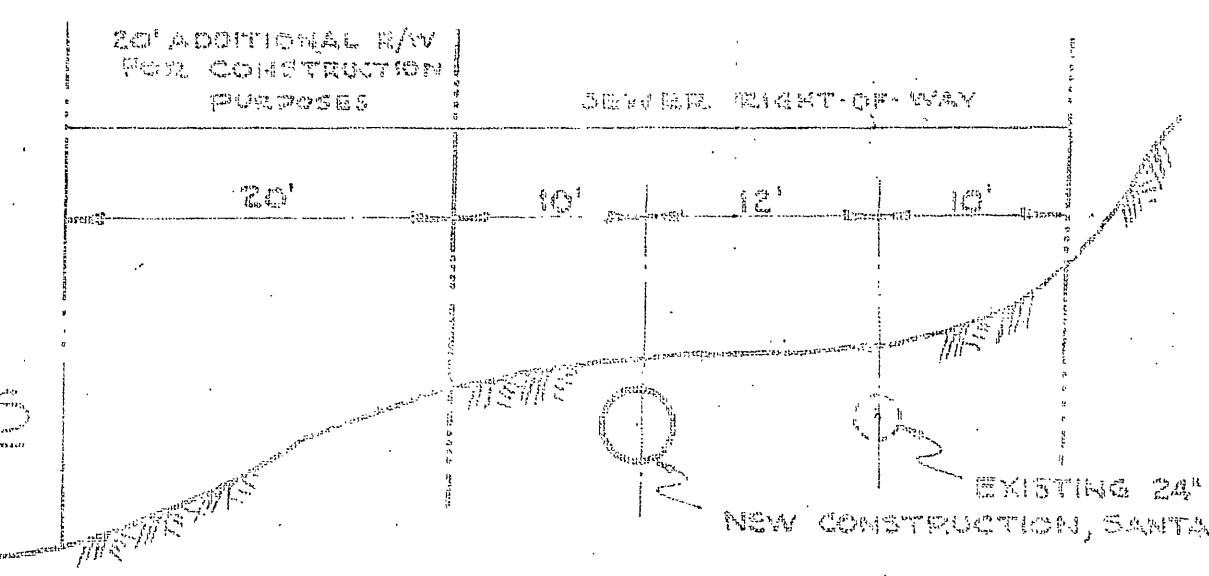


NOT TO SCALE  
**DETAIL OF FILL OVER PIPE AND BEDDING OF PIPE WHERE BOTTOM OF PIPE IS ABOVE EXISTING GRADE**  
ITEM NO. 3



**SECTION SHOWING OLD & PROPOSED TUNNELS**

**DITCH DETAILS**



ALL USE OF LAND OUTSIDE OF EASEMENT AND RIGHT-OF-WAY SHALL BE RESTORED TO GRADE OR GRADES OF ADJOINING AREA. ALL FENCES OR GATES WILL BE MAINTAINED IN STOCK-PROOF CONDITION DURING CONSTRUCTION AND REPLACED ON COMPLETION OF PROJECT WITH THE ORIGINAL OR EQUAL MATERIAL.

NOTE: JOINTS ON EXISTING 24" V.C.P. ARE WEAK WHEN THERE IS A HEAD ON THE 24" V.C.P. AND GROUND REMOVED FROM AROUND JOINTS, JOINTS WILL HAVE BAD LEAKS.

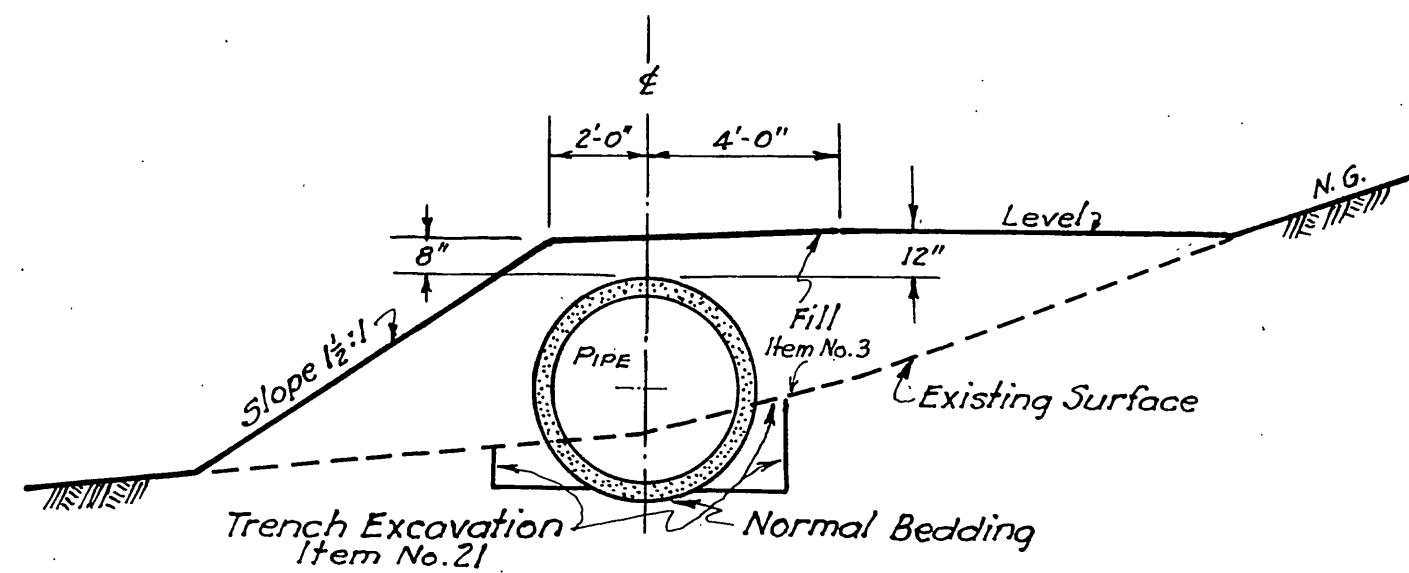
**TYPICAL CROSS-SECTION AND RIGHT-OF-WAY DETAIL**

As Built, July 1959

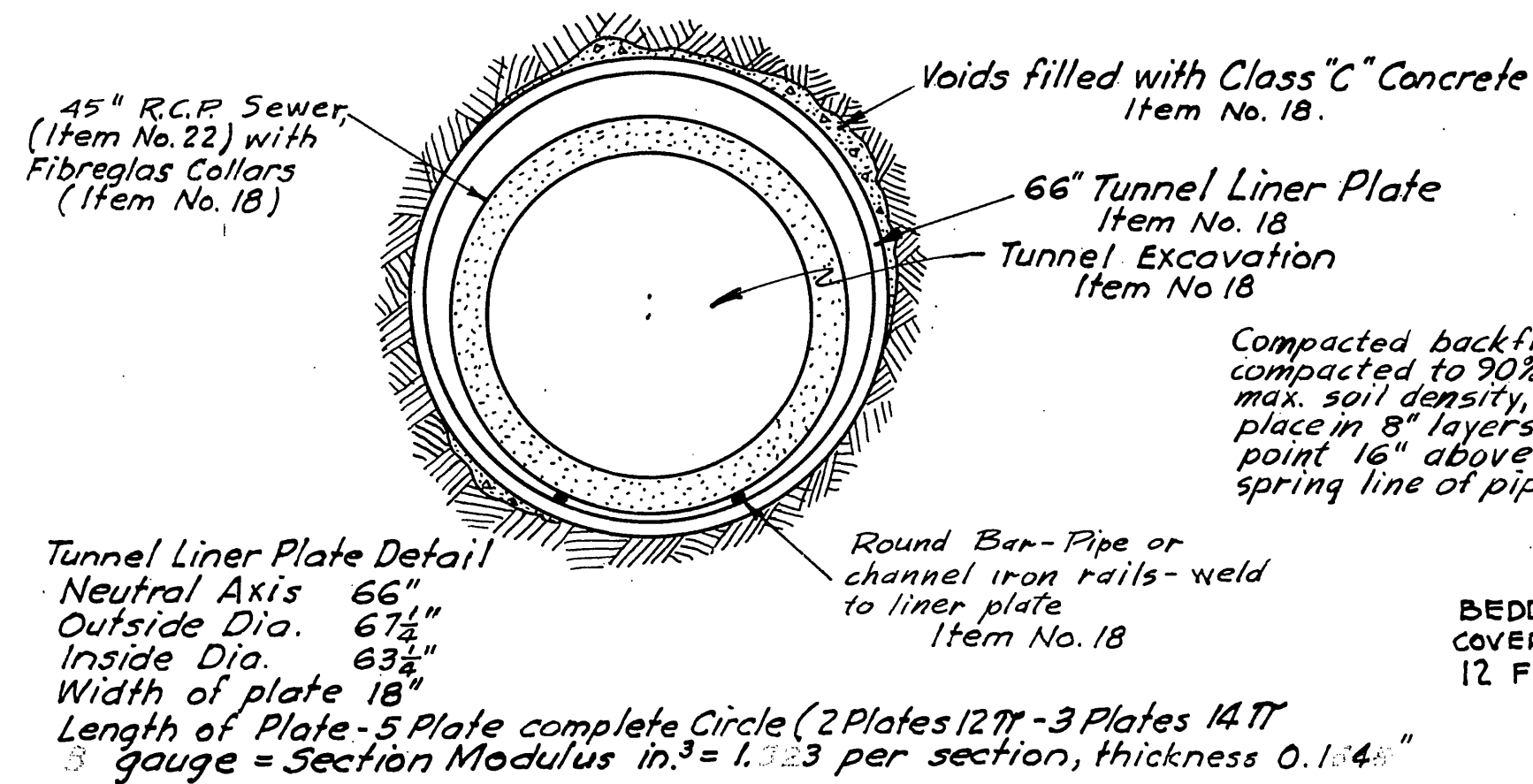
REVISIONS			APPROVED BY JOHN A. CAROLLO CONSULTING ENGINEER PHOENIX, ARIZONA CITY OF RIVERSIDE, CALIFORNIA DEPARTMENT OF PUBLIC WORKS
MARK	DATE	DESCRIPTION	
Δ	11-12-57	REVISIONS REQUIRED BY THE U.P.R. CO.	SANTA ANA OUTFALL MISCELLANEOUS DETAILS
DESIGNED BY: R.O.L. CHECKED BY: G.C.W.			APPROVED BY: <i>Francis L. Lafala</i> 9-30-57
DRAWN BY: G.C.W.			

S-101



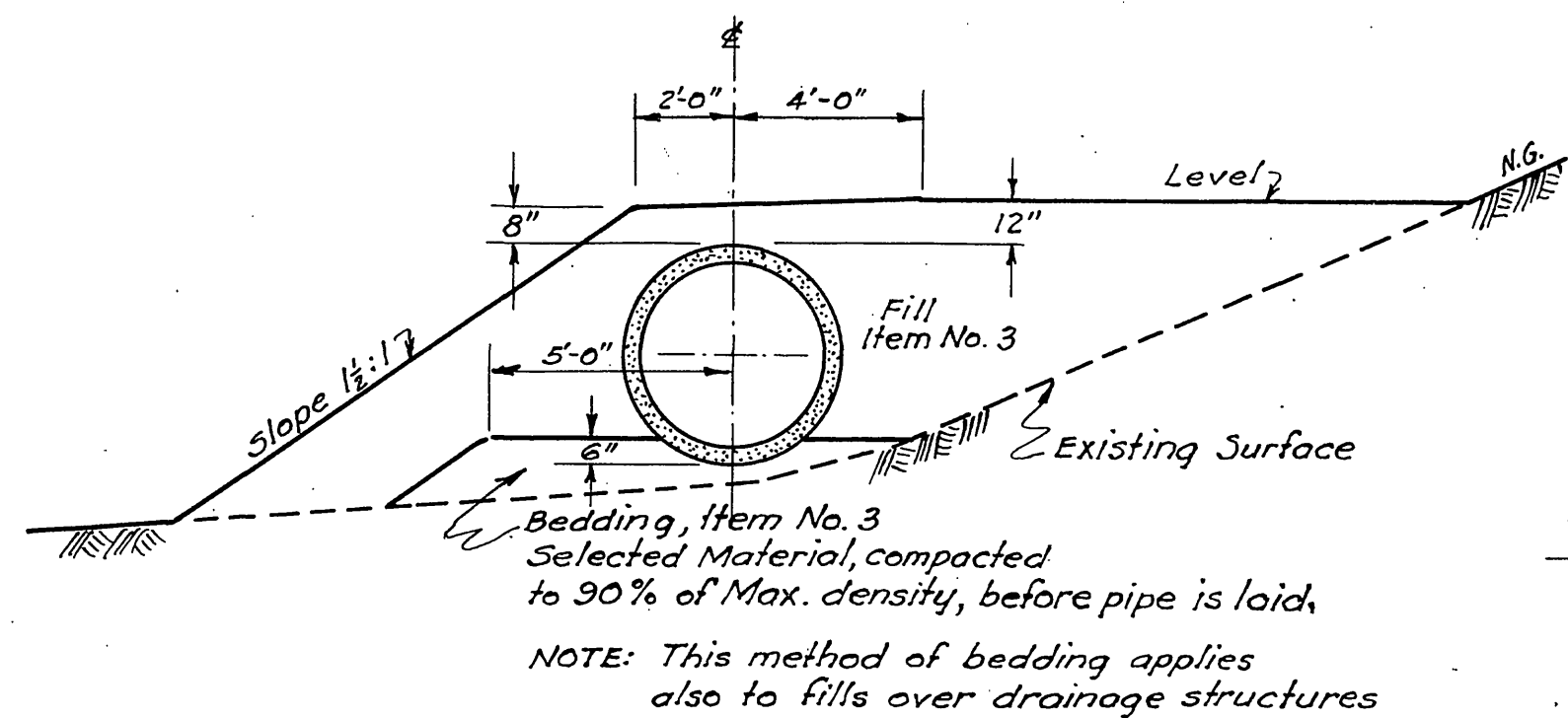


NOT TO SCALE  
**DETAIL OF FILL OVER PIPE WHERE TOP OF PIPE IS ABOVE EXISTING GRADE**  
 ITEM NO. 3

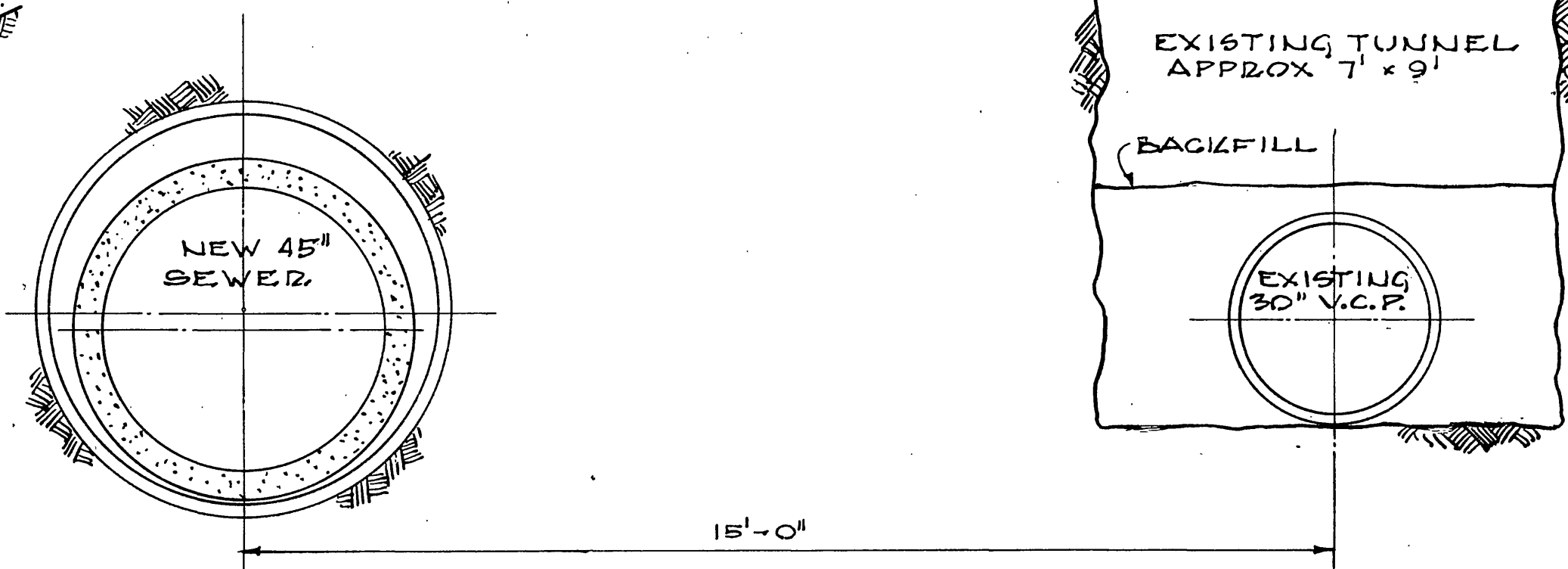


**TYPICAL TUNNEL SECTION**  
 STA. 61+25 TO STA. 64+98.5

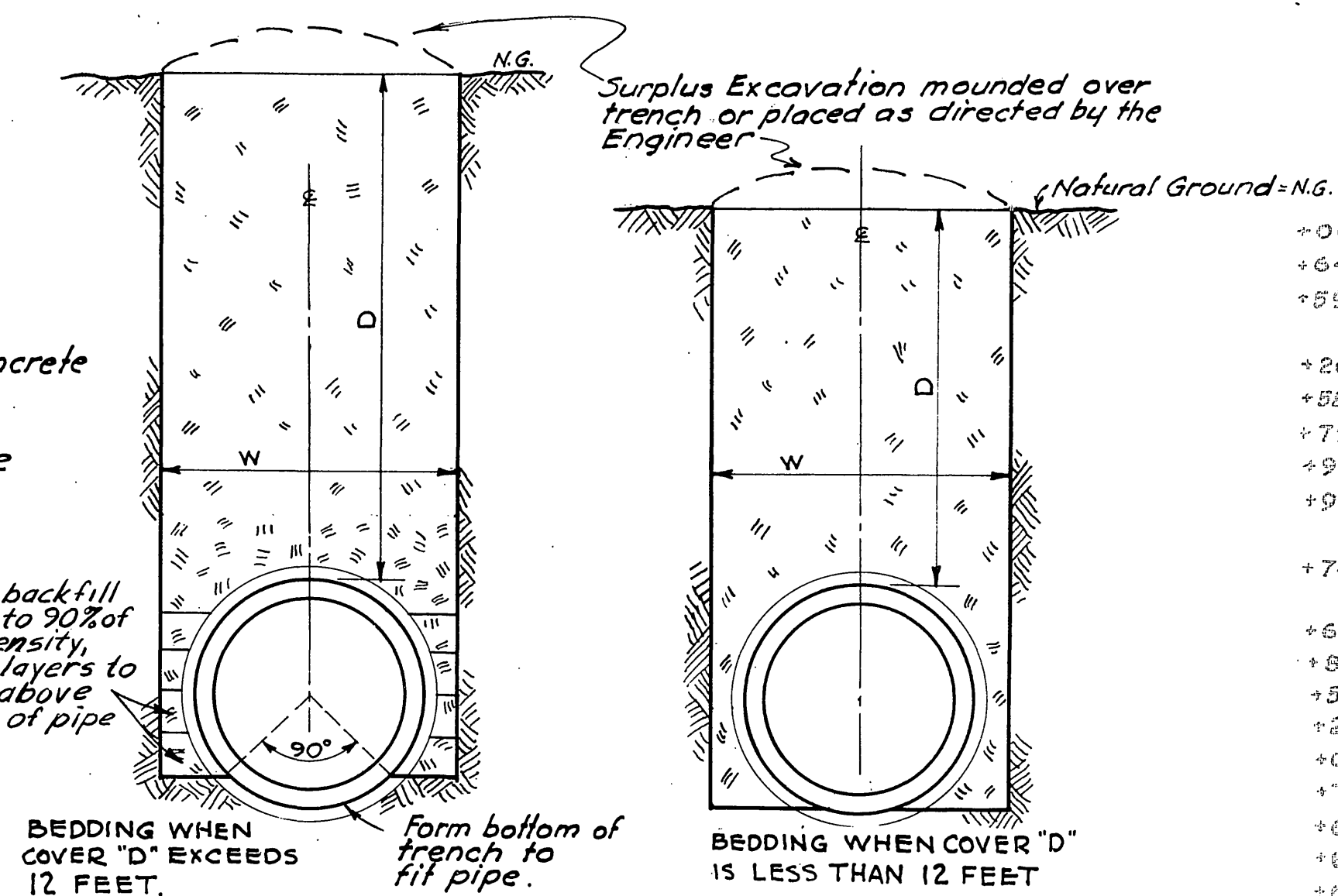
ITEM NO. 18



NOT TO SCALE  
**DETAIL OF FILL OVER PIPE AND BEDDING OF PIPE WHERE BOTTOM OF PIPE IS ABOVE EXISTING GRADE**  
 ITEM NO. 3



**SECTION SHOWING OLD & PROPOSED TUNNELS**

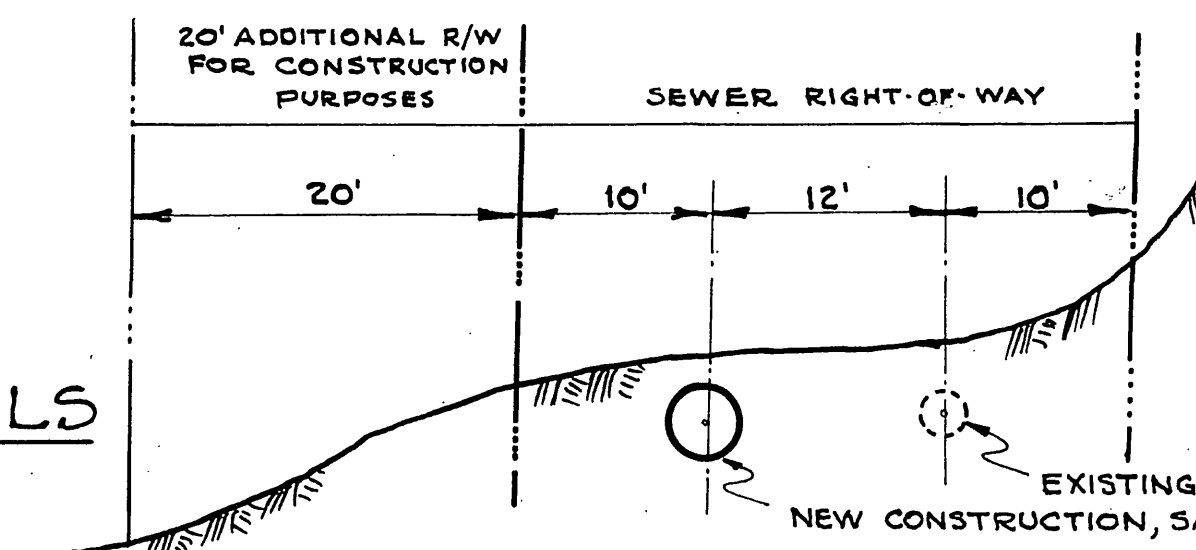


**TABLE FOR TRENCH WIDTH**

I.D. OF PIPE	WIDTH OF TRENCH	
	THICK WALL CONG. PIPE	VITRIFIED CLAY AND PLASTIC LINED CONG. PIPE
45 inch	7'-0"	6'-9"
39 inch	6'-6"	6'-3"
36 inch	6'-2"	5'-11"
33 inch	5'-10"	5'-6"
24 inch		4'-6"
15 inch		3'-0"

Pay for Item No 21 is base on max. trench width

**DITCH DETAILS**



ANY USE OF LAND OUTSIDE OF EASEMENT AND RIGHT-OF-WAY SHALL BE RESTORED TO GRADE OR GRADES OF ADJOINING AREA. ALL FENCES OR GATES WILL BE MAINTAINED IN STOCK-PROOF CONDITION DURING CONSTRUCTION AND REPLACED ON COMPLETION OF PROJECT WITH THE ORIGINAL OR EQUAL MATERIAL.

NOTE: JOINTS ON EXISTING 24" V.C.P. ARE WEAK WHEN THERE IS A HEAD ON THE 24" V.C.P., AND GROUND REMOVED FROM AROUND JOINTS, JOINTS WILL HAVE BAD LEAKS.

**TYPICAL CROSS-SECTION AND RIGHT-OF-WAY DETAIL**

**TABLE FOR SPECIAL PIPE ANGLES**

STATION	SIZE	ANGLE
1+22.8	45"	45°
5+00.5	45"	38°
5+65	45"	40°
11+60	45"	30°
21+75	45"	26°
25+20.1	45"	30°
29+57.6	45"	13°
39+79	45"	11°
47+99.6	45"	26°
47+99.6	45"	26°
52+70.1	45"	26°
53+75	45"	16 1/2°
56+08.1	45"	34°
58+61.4	45"	13°
66+86.1	45"	13°
68+50.5	45"	16 1/2°
92+25.7	45"	28°
94+06.5	39"	26°
97+89.9	39"	19°
99+69.9	39"	19°
109+64	39"	13 1/2°
116+66	39"	24°
131+11.8	39"	24°
135+81	39"	30°
138+71.75	39"	8°
140+97.7	39"	47°
149+32.2	39"	14°
154+64.3	36"	20°

As built, July 1959

REVISIONS			APPROVED BY
MARK	DATE	DESCRIPTION	
Δ	11-12-57	REVISIONS REQUIRED BY THE U.P.R. CO.	JOHN A. CAROLLO CONSULTING ENGINEERS PHOENIX, ARIZONA CITY OF RIVERSIDE, CALIFORNIA DEPARTMENT OF PUBLIC WORKS <b>SANTA ANA OUTFALL</b> MISCELLANEOUS DETAILS
DESIGNED BY R.D.L.		CHECKED BY G.C.W.	9-30-57 DIRECTOR OF PUBLIC WORKS ASSISTANT CITY ENGINEER
DRAWN BY G.C.W.			
RECOMMENDED BY			SHEET 15 OF 15 9-30-57