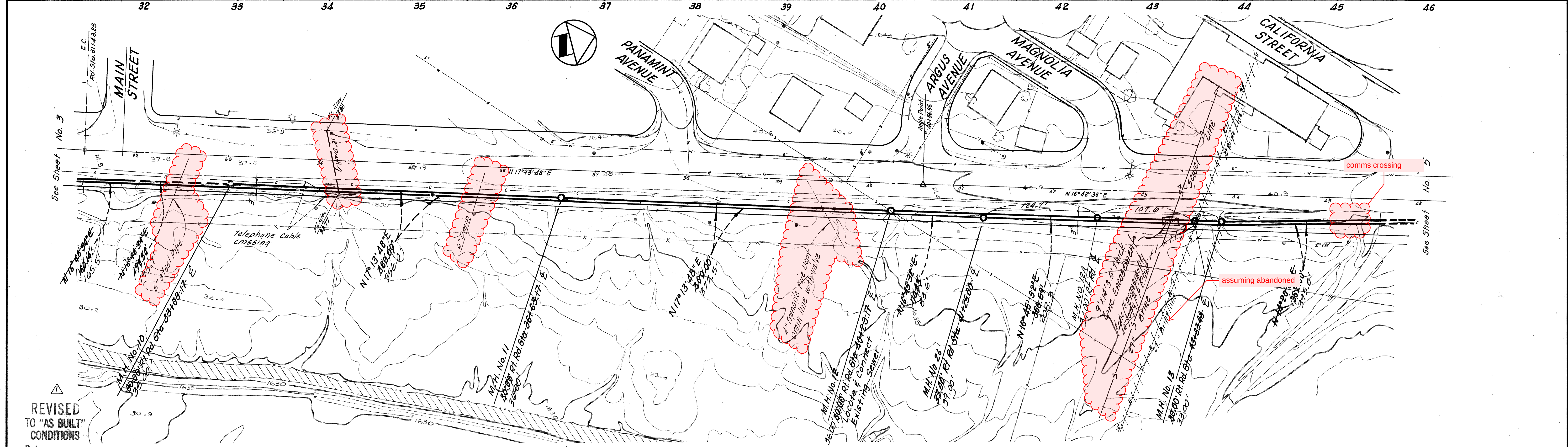
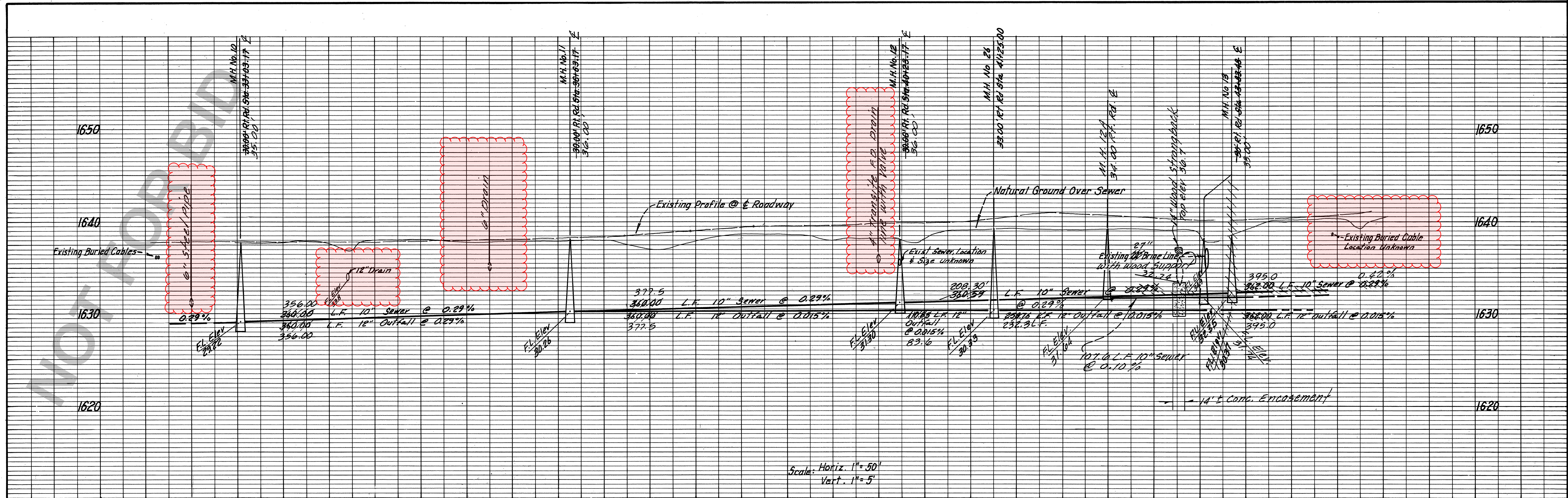




NOTE: Existing Poles Adjacent to Proposed Sewer to be Relocated as Required by Serving Utility.

Revision	No.	By	Date	Appr.
Revised to "AS BUILT" Conditions	1	W.S.	11-18-80	RF

Submitted By:	
R.C.E. No. 27,485	
Designed: E. Shaw & R. Leja	
Drawn: C.E.M.	

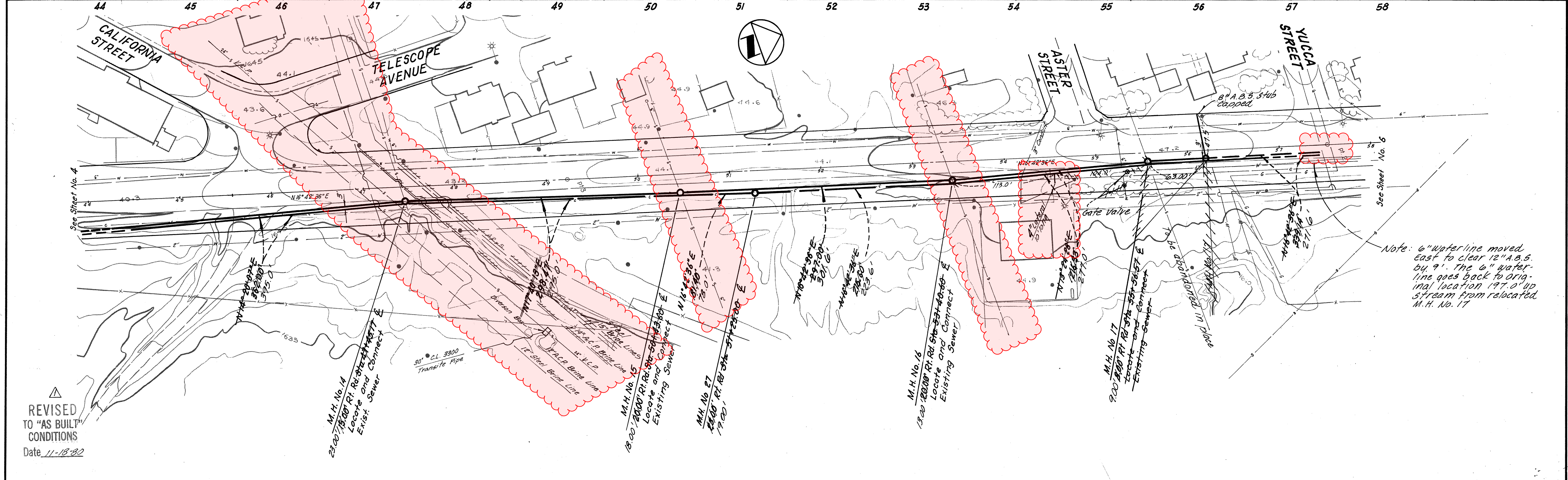
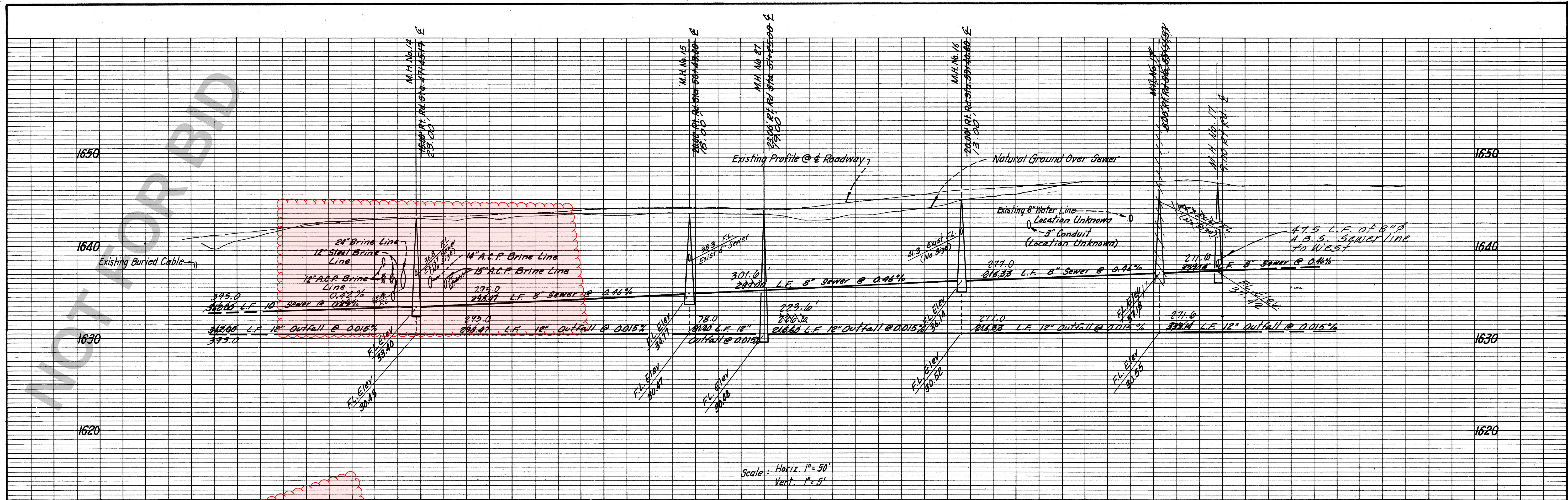
2/23/79	Date
J.R.D.	Checked
05-78-01	Job No.

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 225 East Airport Drive, San Bernardino, California

COUNTY OF SAN BERNARDINO
COUNTY SERVICE AREA 82
 WASTEWATER FACILITIES

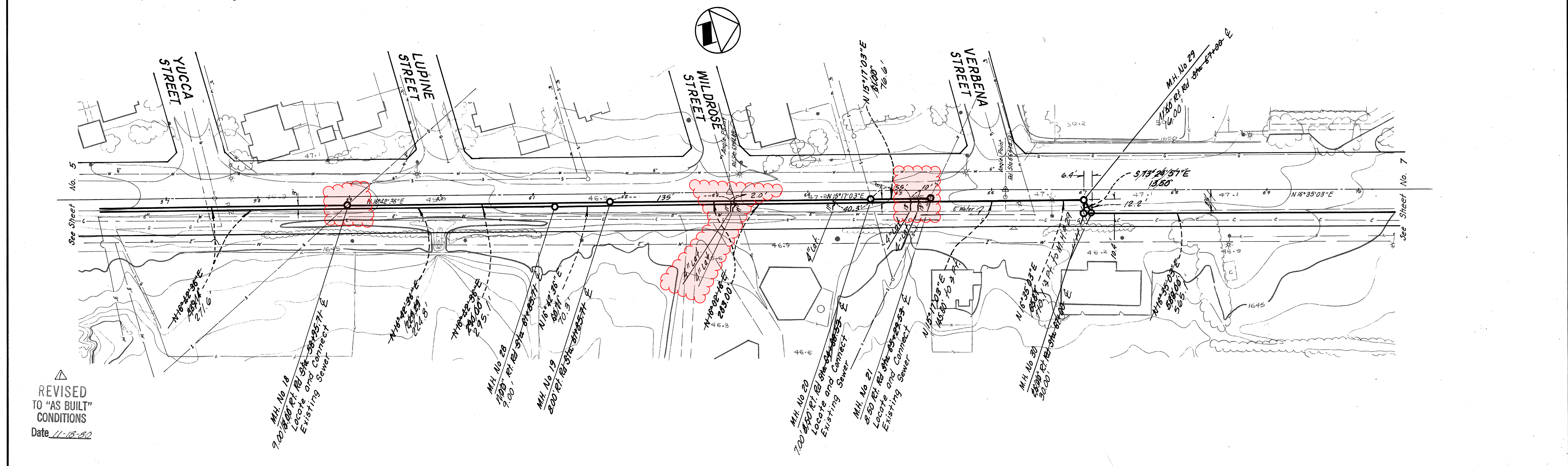
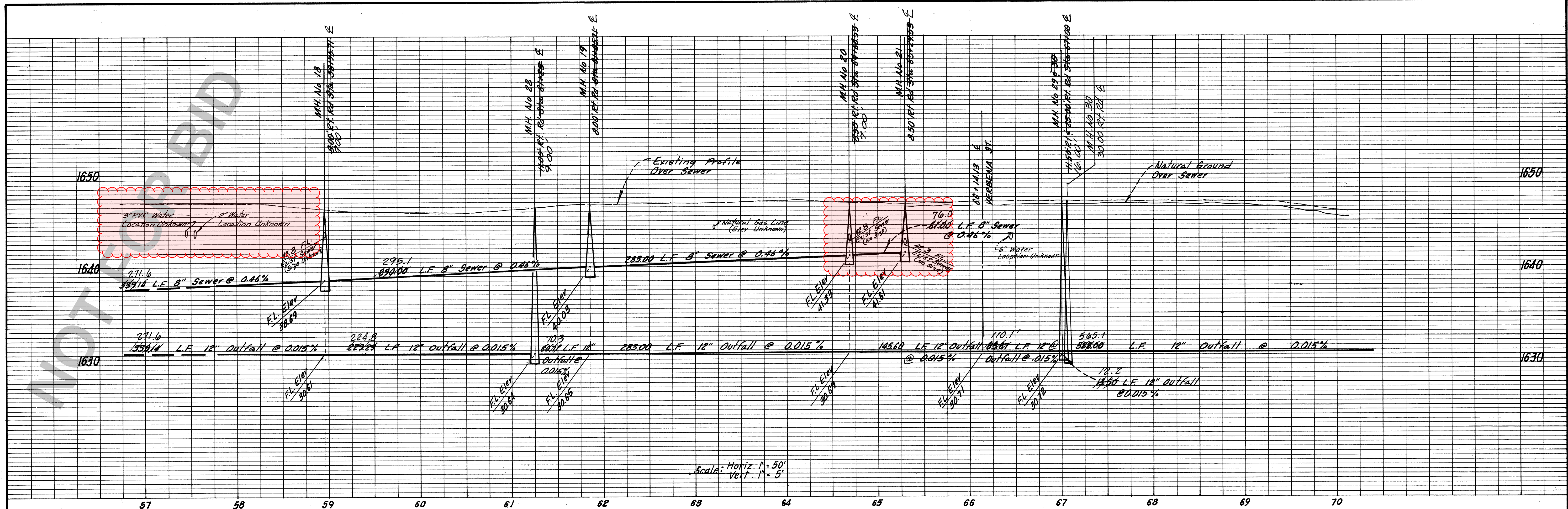
SEARLES VALLEY
 TRONA ROAD
 GRAVITY SEWER - MH No 10 To STA 46
 OUTFALL SEWER - STA 33 To STA 46

Sheet 4 of 5
 Sheets Dwg No.



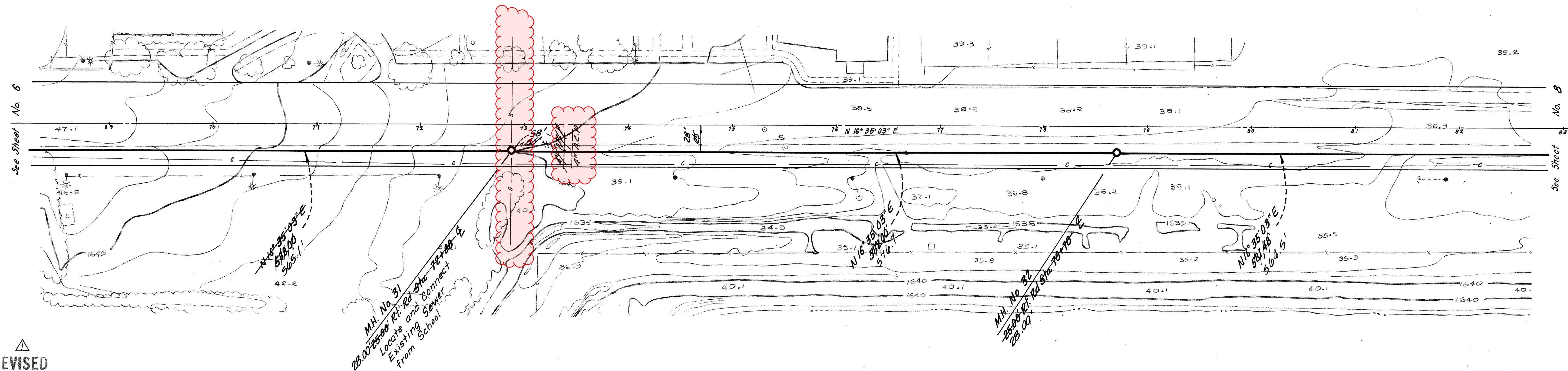
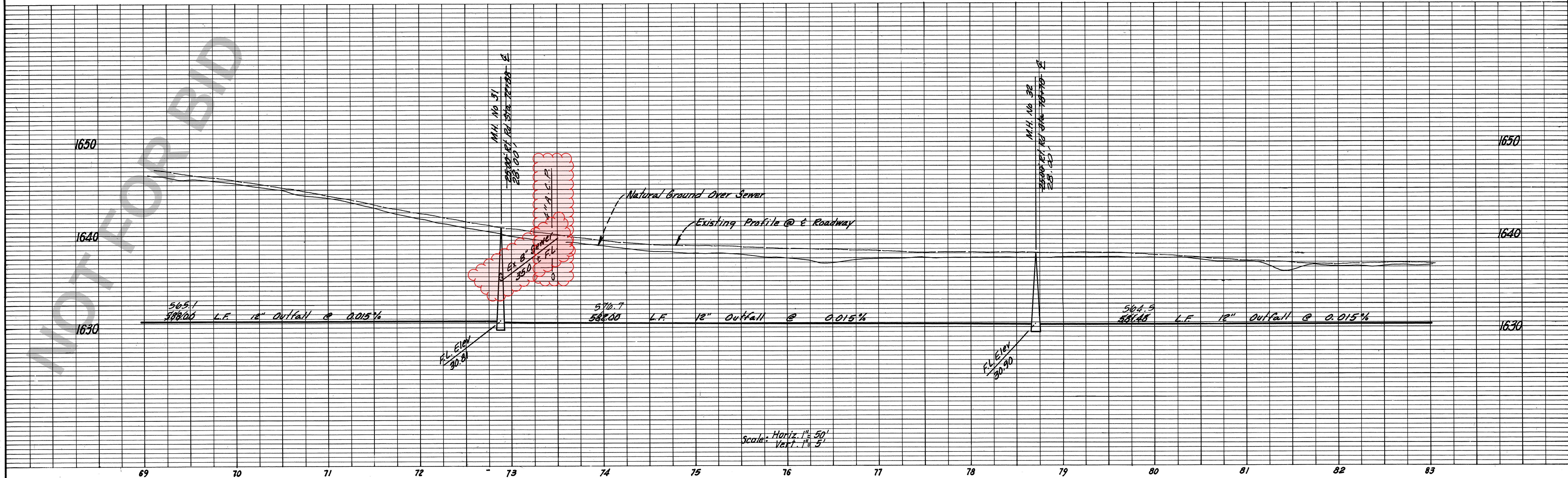
Revision	No.	By	Date	Appr.	Submitted By:	Checked	Date	County of San Bernardino	Searles Valley	Sheet 5 of 19
Revised to "As Built" Conditions	1	W.S.	11-18-82	R.F.	John R. Dulla	J.R.D.	2/23/77	County Service Area 82	Trona Road	Sheet 5 of 19
					R.C.E. No. 27,485			Wastewater Facilities	Gravity Sewer - STA 46 To STA 57	Dwg. No.
					Designed E. Shaw & P. Leja	Job No.	05-78-01		Outfall Sewer - STA 46 To STA 57	
					Drawn L.E.M.					





REVISED
TO "AS BUILT"
CONDITIONS
Date 11-18-82

Revision	No.	By	Date	Appr.	Submitted By:	ENGINEERING ASSOCIATES	COUNTY OF SAN BERNARDINO	SEARLES VALLEY	Sheet 6 of 19
Revised to "As Built" Conditions	1	W.S.	11-18-82	RF	John R. Dillha	Mail P. O. Box 6087 92412 Phone (714) 884-8804 or (714) 825-9562 225 East Airport Drive, San Bernardino, California	COUNTY SERVICE AREA 82	TRONA ROAD GRAVITY SEWER - STA 57 To MH No 21 OUTFALL SEWER - STA 57 To STA 70	
					Designed E. Shaw & P. Leja				
					Drawn L.R.M.				
					Checked J.R.D.				
					Job No. 05-78-01				



REVIS
TO "AS BUILT"
CONDITIONS
Date 11-18-80

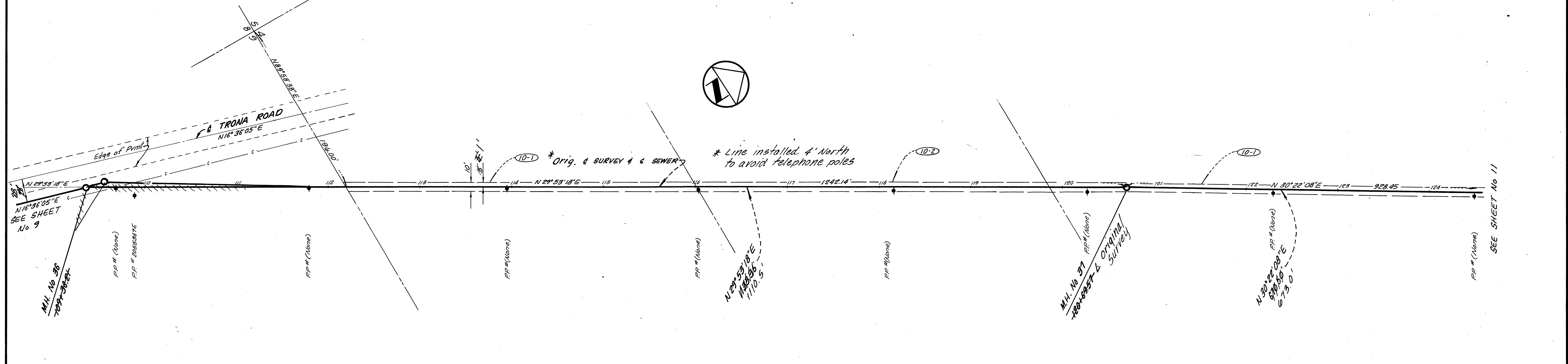
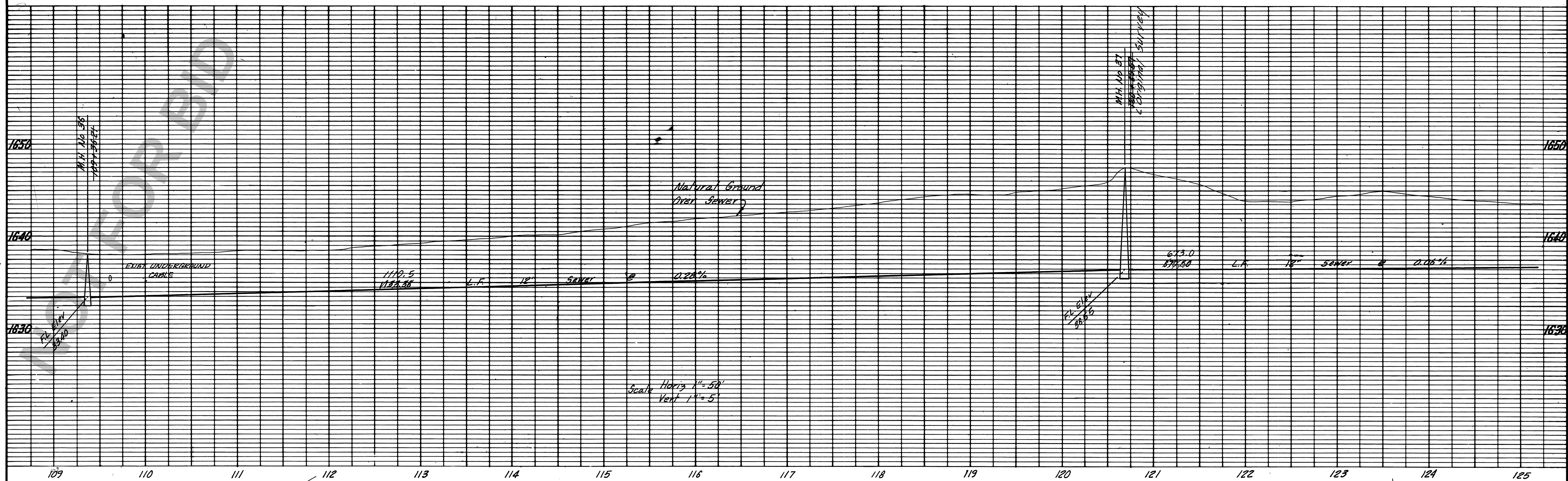
Revision	No.	By	Date	Appr.
Revised to "As Built" Conditions	1	W.S.	11-18-80	RF

Submitted By:	
<i>R. D. Dulla</i>	2/23/79
R.C.E. No. 27,485	Date
Designed <i>E. Shaw & P. Leja</i>	Checked <i>J.R.D.</i>
Drawn <i>L.R.M.</i>	Job No. 05-78-01



COUNTY OF SAN BERNARDINO
COUNTY SERVICE AREA 82
WASTEWATER FACILITIES

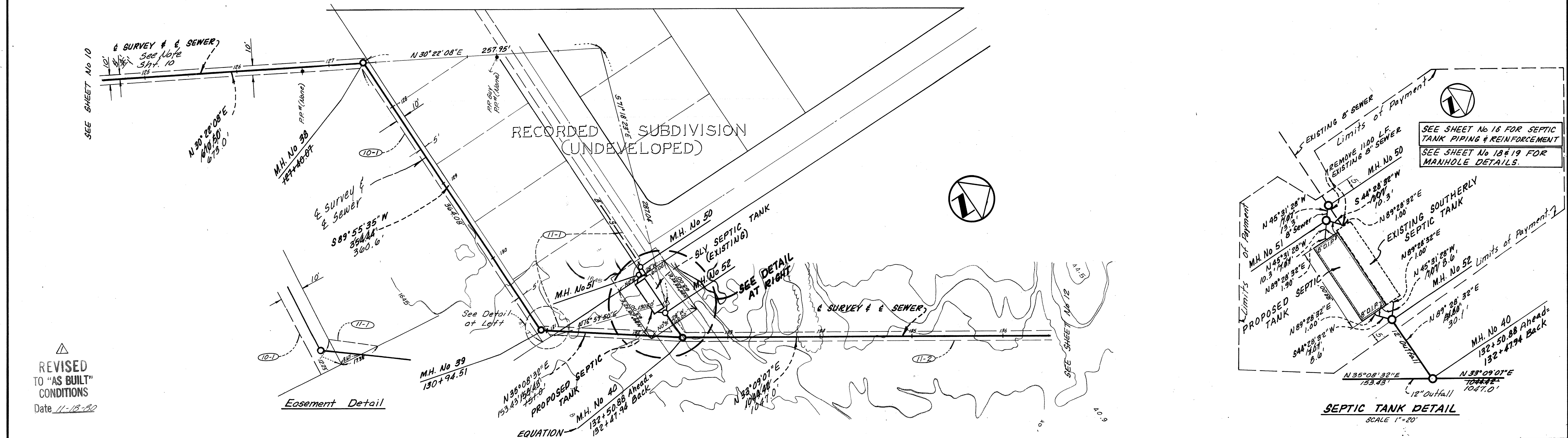
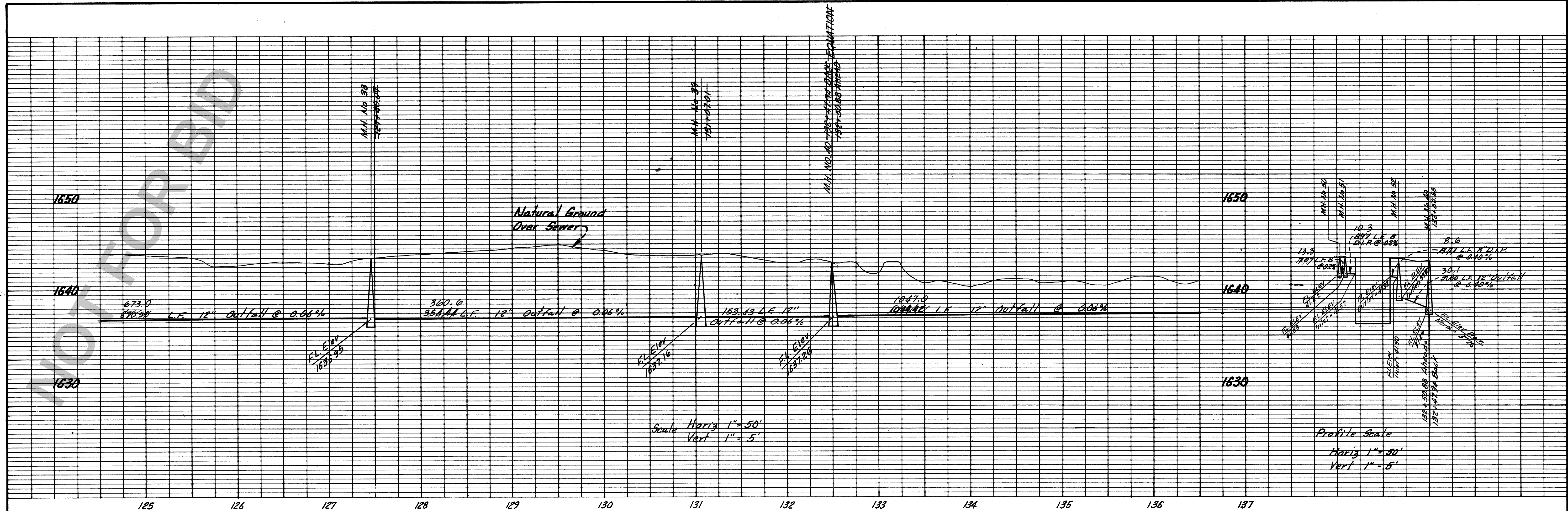
SEARLES VALLEY
TRONA ROAD
OUTFALL SEWER-STA 70 TO STA 83
Sheet 7 of 9
Dwg. No.



REVISION TO "AS BUILT" CONDITIONS
 Date 11-18-80

NOTE: Existing Poles Adjacent to Proposed Sewer to be protected during construction as required by serving utility.

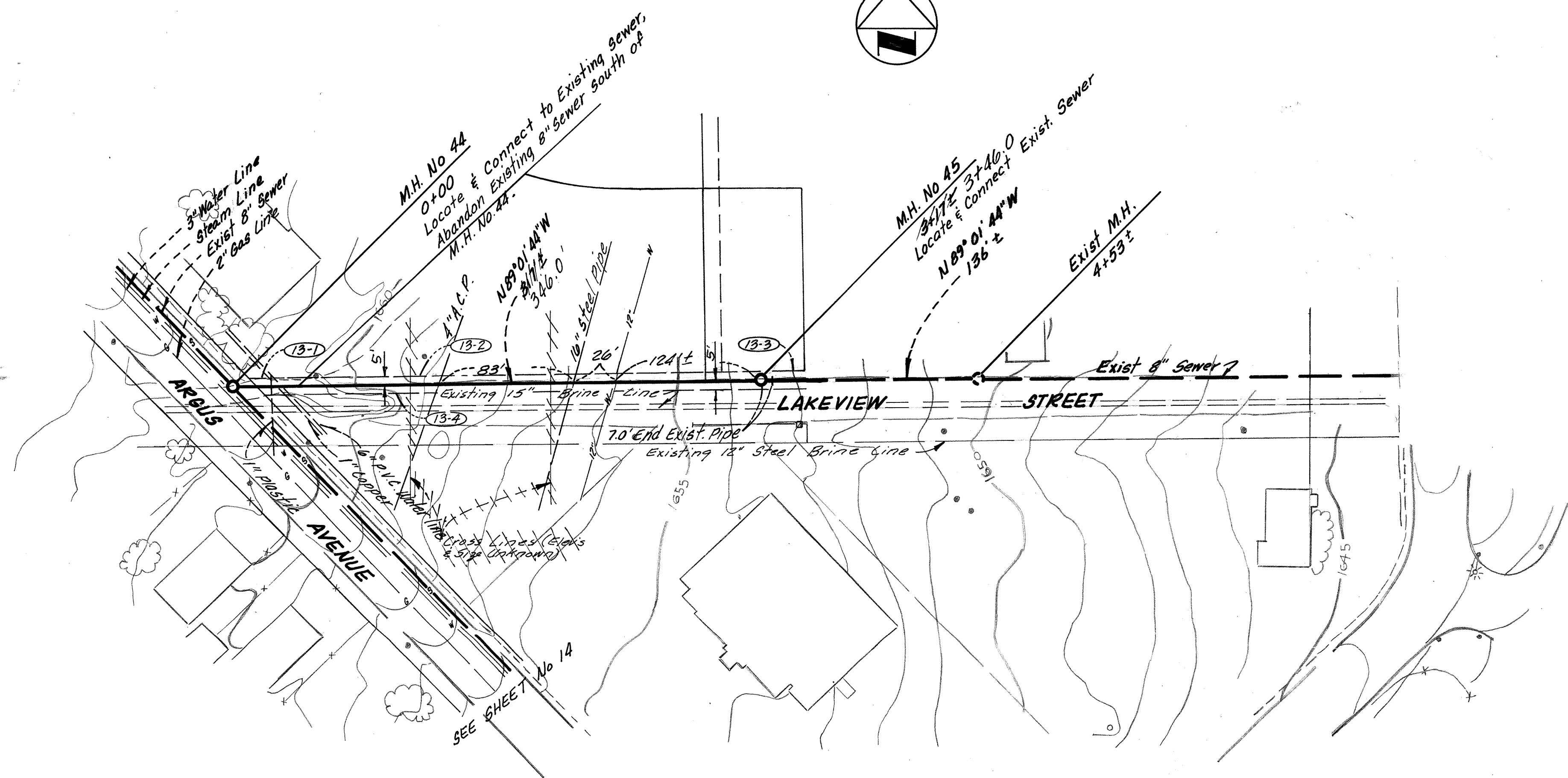
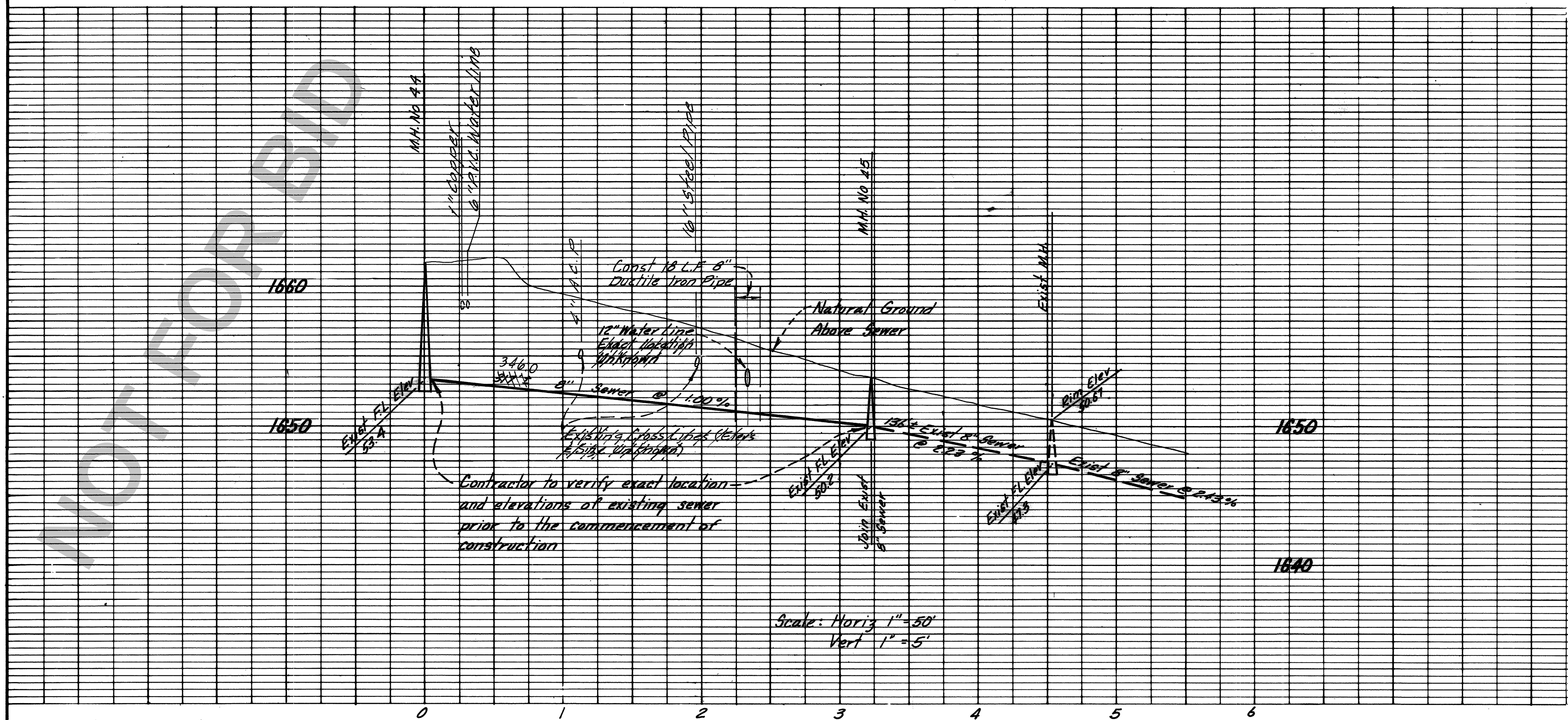
Revision	No.	By	Date	Appr.	Submitted By:	Design	Checked	Date	Drawn	Job No.	CM ENGINEERING ASSOCIATES	COUNTY OF SAN BERNARDINO	SEARLES VALLEY	Sheet 10 of 19
revised to "As Built" Conditions	1	N.S.	11-18-80	R.F.	John R. Dalka	E. Shaw & P. Leja	J.R.D.	2/23/79	L.R.M.	05-78-01	225 East Airport Drive, San Bernardino, California	COUNTY SERVICE AREA 82	PIONEER POINT To TRONA ROAD	Sheet 10 of 19
												WASTEWATER FACILITIES	OUTFALL SEWER-MH No 36 To STA 125	Sheet 10 of 19



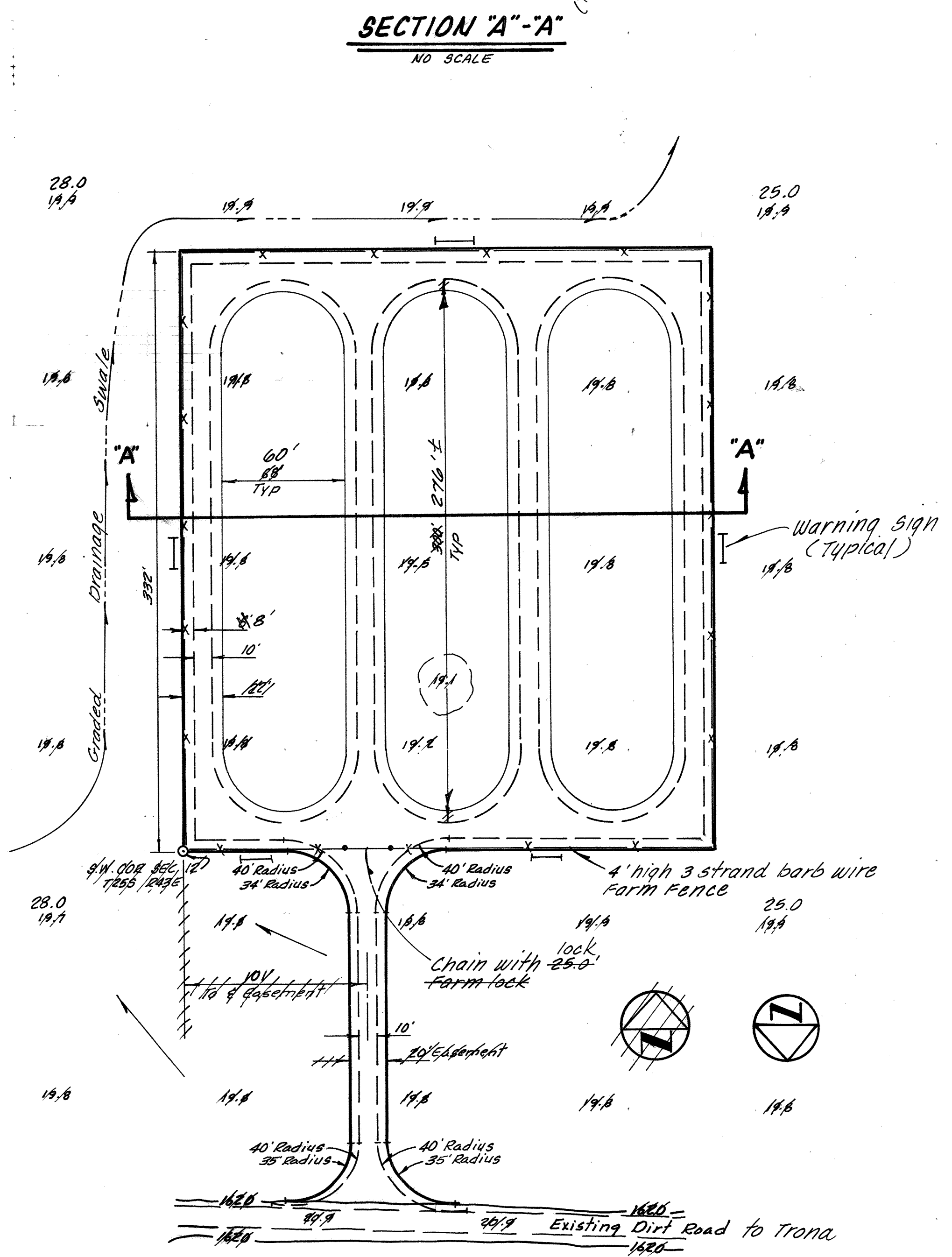
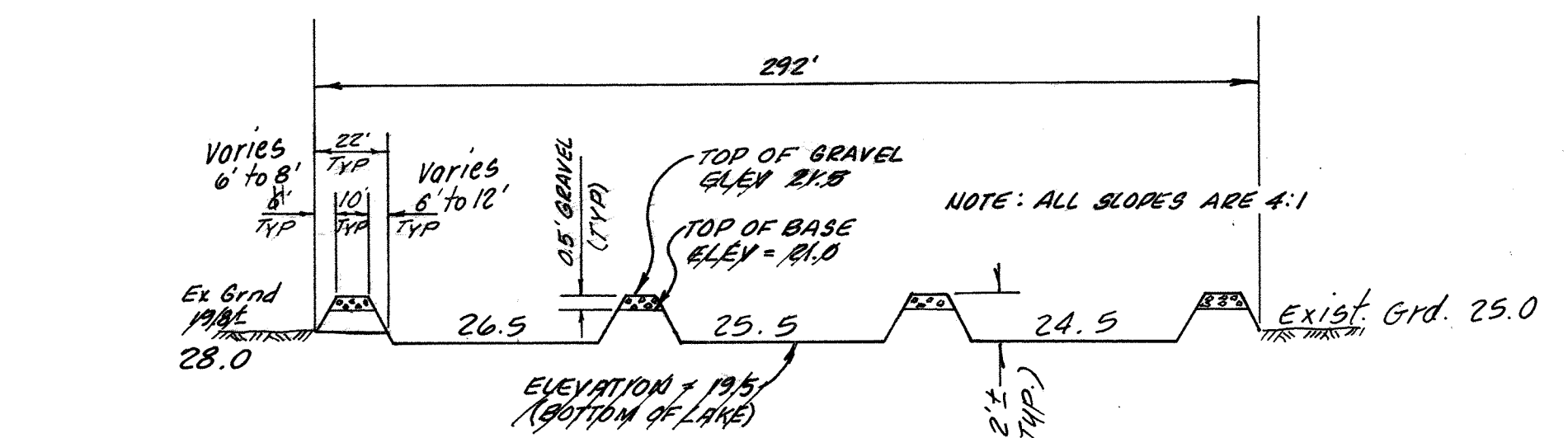
Revision	No.	By	Date	Appr.
Revised to "As Built" Conditions	15	W.S.	11-18-80	REF

Submitted By:	Date:
R.C.E. No. 27,485	2/23/79
Designed: E. Shaw & P. Leja	Checked: J.R.D.
Drawn: L.E.M.	Job No. 05-78-01

CM ENGINEERING ASSOCIATES Mail P.O. Box 6087 92412 Phone (714) 884-8804 or (714) 825-9562 225 East Airport Drive, San Bernardino, California	COUNTY OF SAN BERNARDINO COUNTY SERVICE AREA 82 WASTEWATER FACILITIES	SEARLES VALLEY PIONEER POINT TO TRONA ROAD OUTFALL SEWER-STA 125 TO STA 136	Sheet 11 of 19 Sheets Dwg. No.
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REVISED
TO "AS BUILT"
CONDITIONS
Date 11-18-80



SEWAGE POND DETAIL
SCALE 1"=50'

Revision	No.	By	Date	Appr.
Revised to "As Built" Conditions	1	W.B.	11-18-80	RF

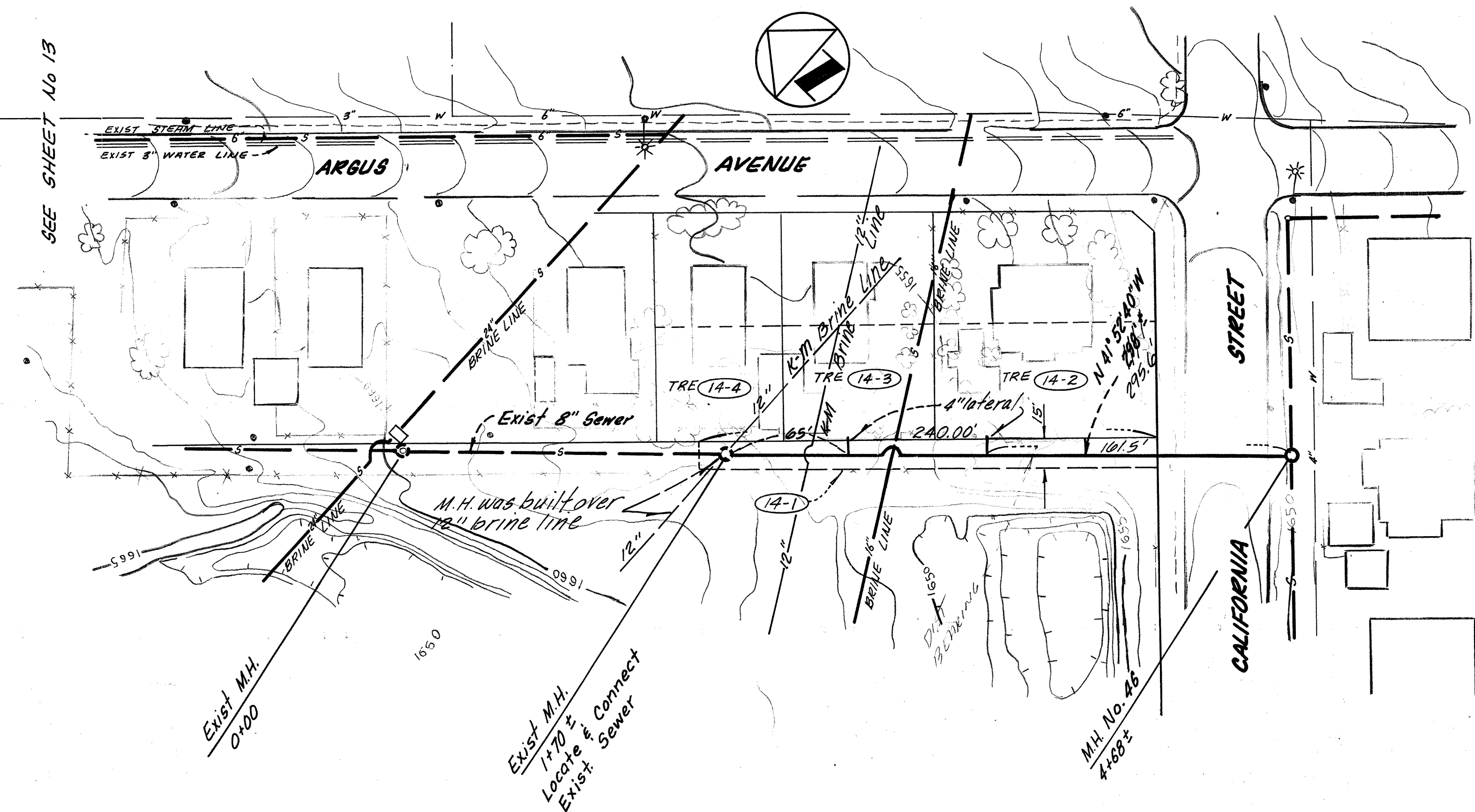
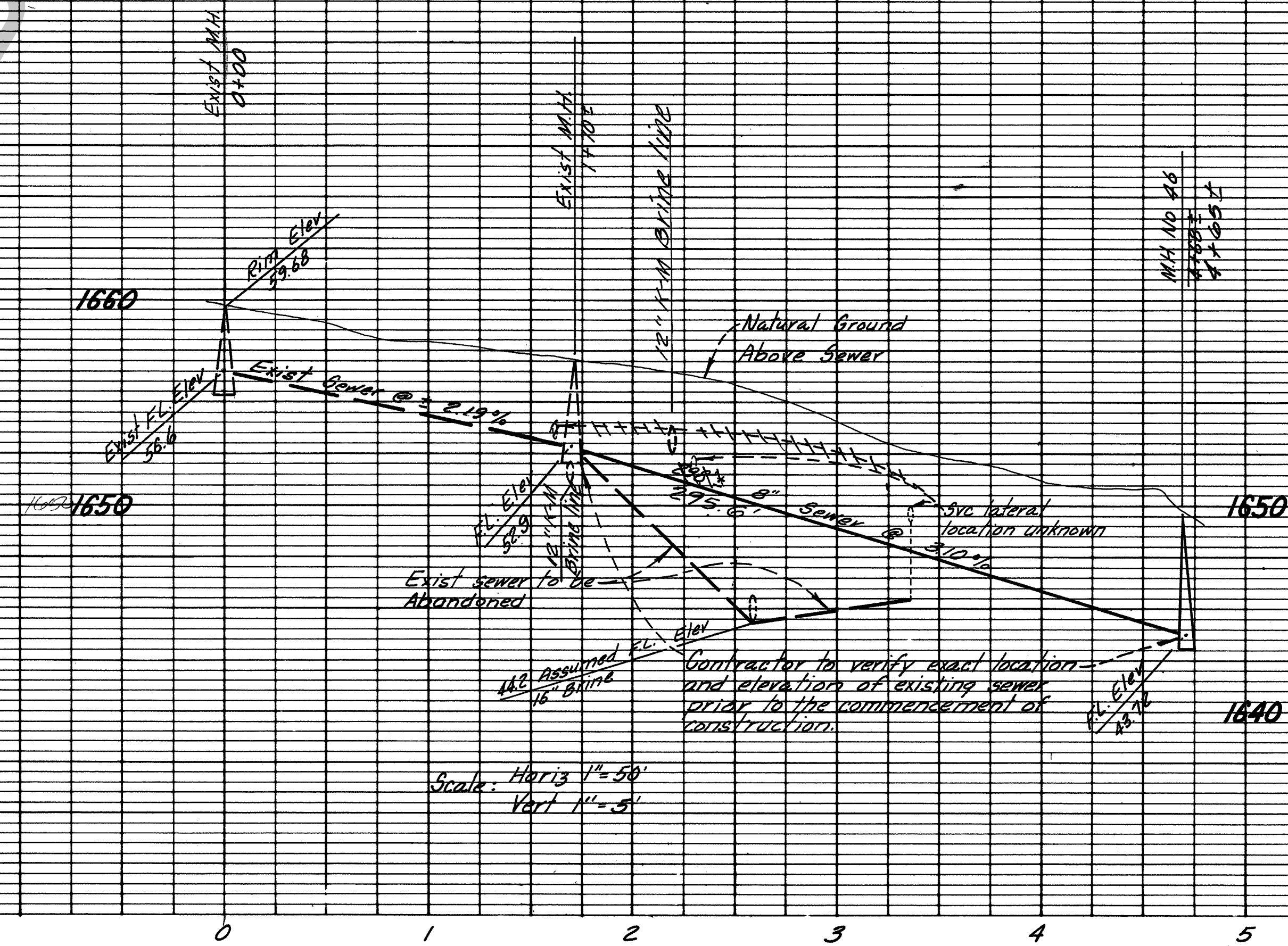
Submitted By:		Date	
John R. Dobbie		2/23/79	
R.C.E. No. 27,485		Date	
Designed	E. Shaw & P. Leja	Checked	J.R.D.
Drawn	L.E.M.	Job No.	05-78-01

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225 East Airport Drive, San Bernardino, California

COUNTY OF SAN BERNARDINO
COUNTY SERVICE AREA 82
WASTEWATER FACILITIES

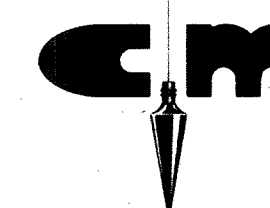
SEARLES VALLEY
LAKEVIEW STREET
GRAVITY SEWER - STA 0+00 TO STA 3+17±
Sheet 13 of 19
Dwg. No.

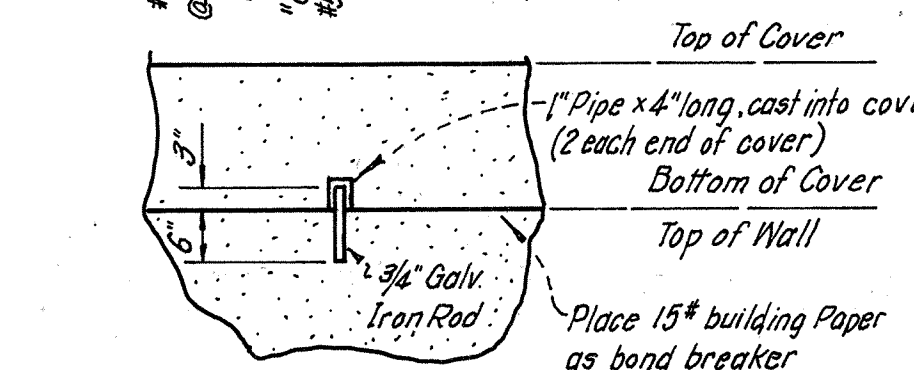
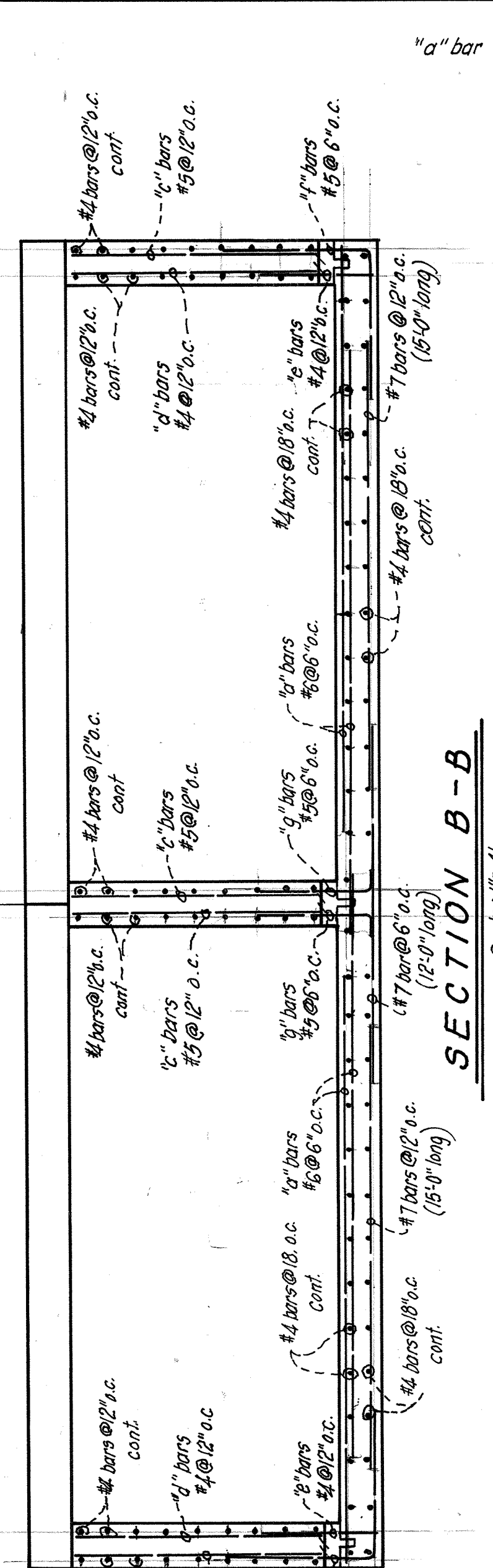
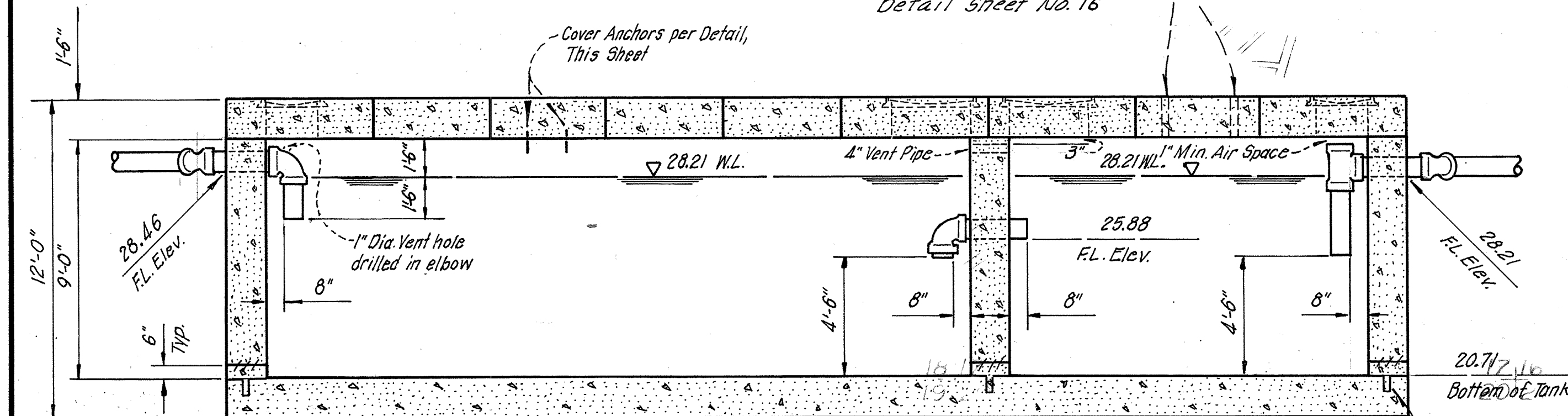
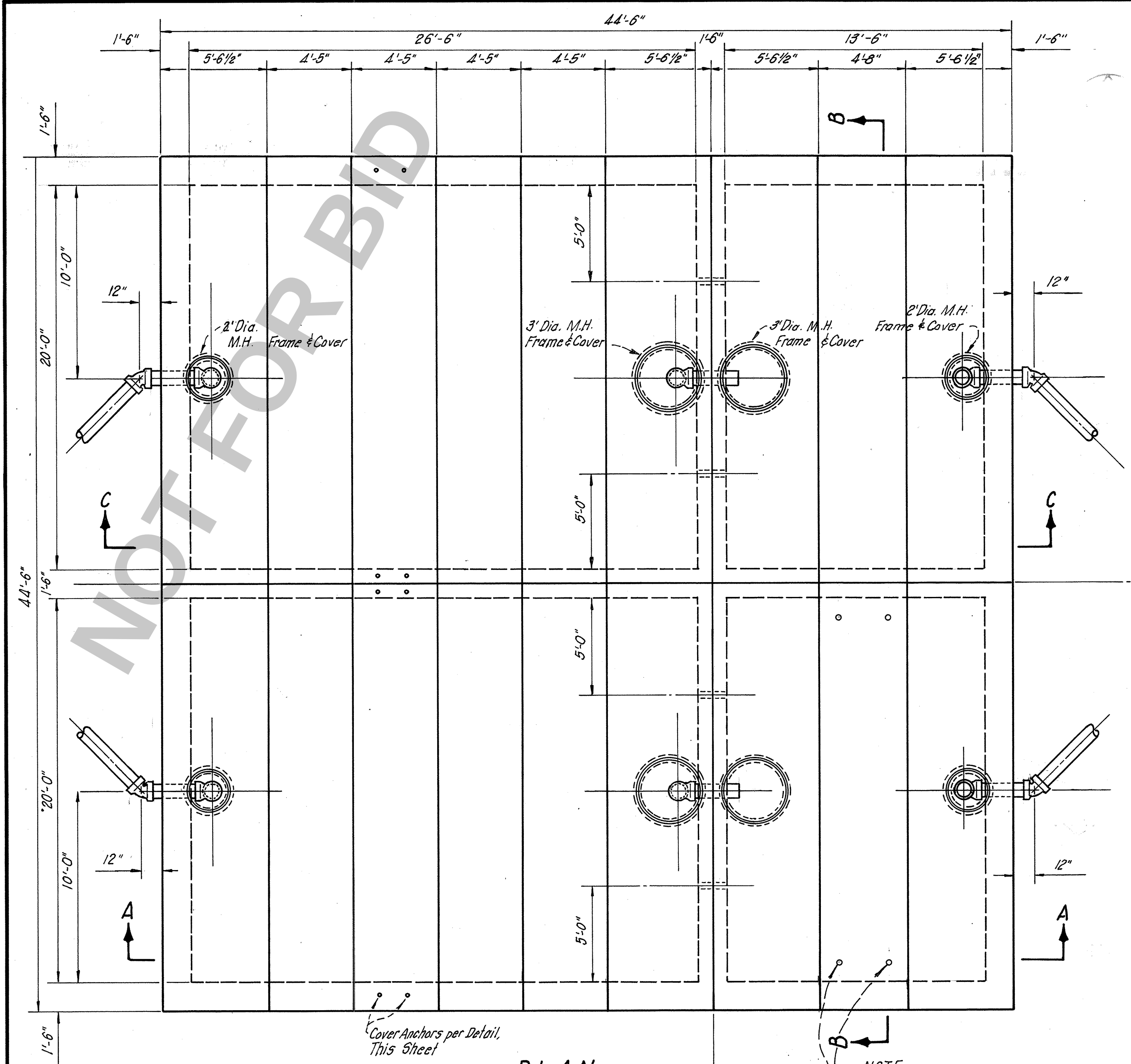
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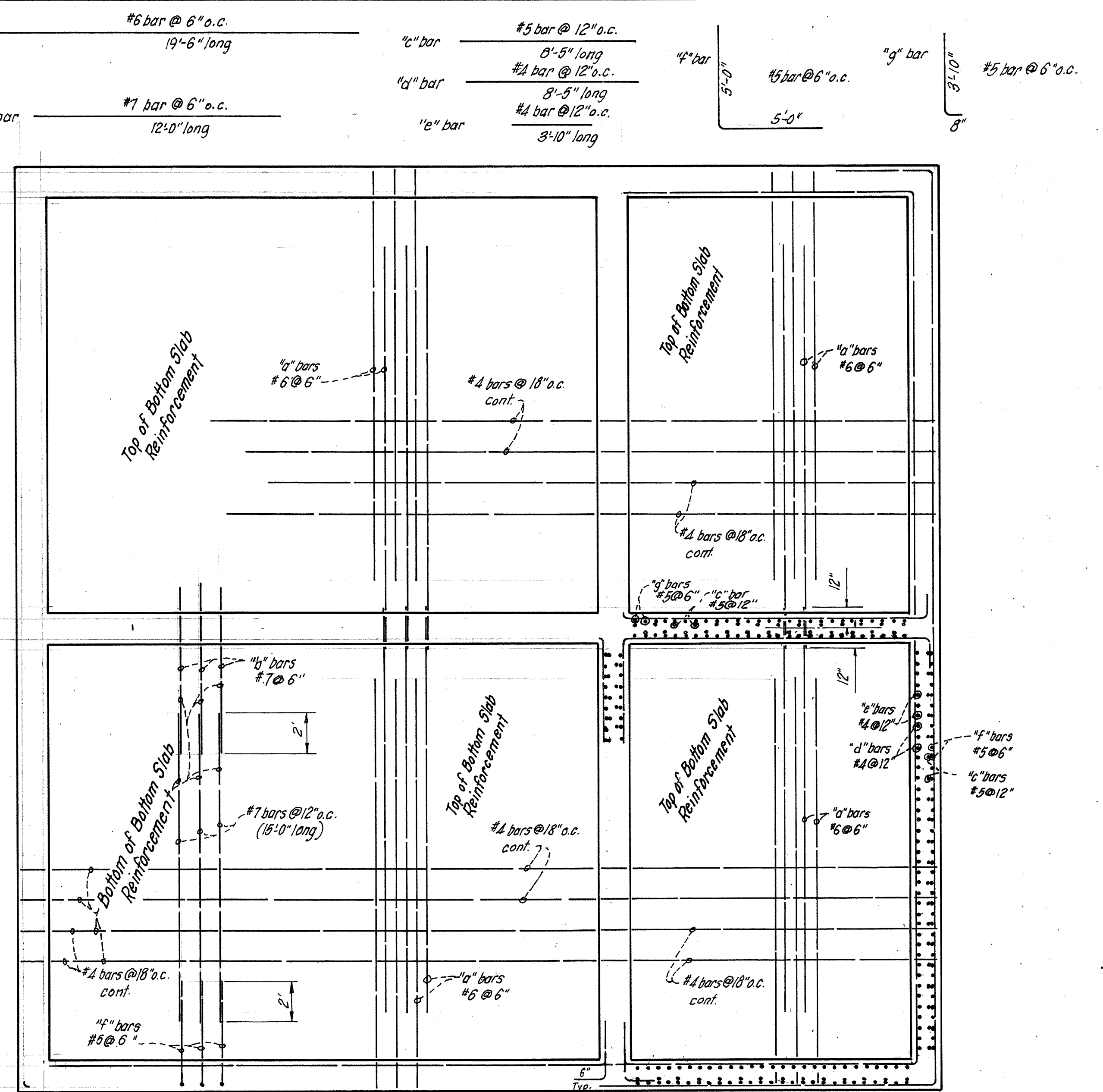
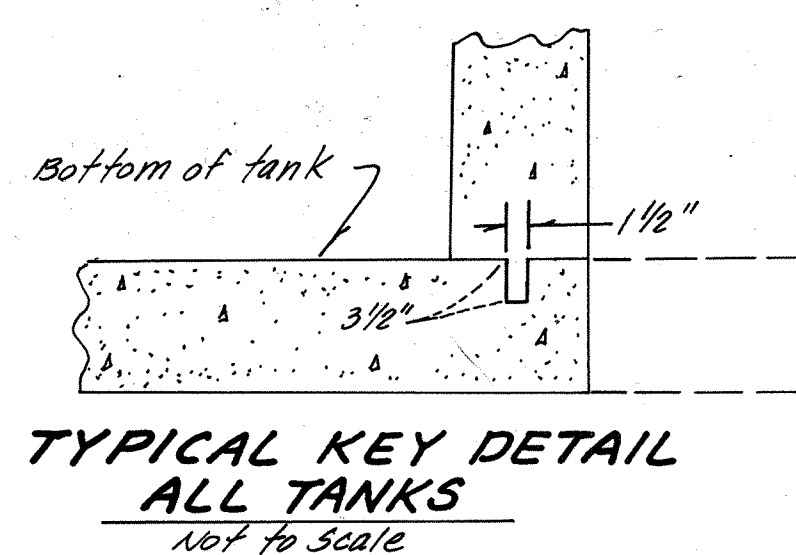
REVIS
TO "AS BUILT"
CONDITIONS
Date 11-13-80

CONTRACTOR NOTE: Reconstruct
Sewer Service Laterals as required
to connect to new sewer.

Revision					No.	By	Date	Appr.		Submitted By:		2/23/79		 ENGINEERING ASSOCIATES Mail P.O. Box 6087 92412 Phone (714) 864-8804 or (714) 825-9562 225 East Airport Drive, San Bernardino, California	COUNTY OF SAN BERNARDINO COUNTY SERVICE AREA 82 WASTEWATER FACILITIES		SEARLES VALLEY CALIFORNIA STREET NORTHERLY GRAVITY SEWER - STA 1+70± To MH No 46		Sheet 14 of 19 Dwg. No.
Revised to "As Built" Conditions					1	W.B.	11-13-80	REP		John R. Dalka		Date							
										R.C.E. No. 27,485									
										Designed E. Shaw & P. Leja		Checked J.R.D.							
										Drawn L.R.M.		Job No. 05-78-01							



NOTE: ALL CONCRETE ON THIS SHEET TO BE CLASS I



Revision	No.	By	Date	Appr.
Revised to "As Built" Conditions	1	W.B.	11-18-80	RF

Submitted By:	2/23/79
R.O.E. No. 27,485	Date
Designed R.L. Forester & R. Leja	Checked J.R.D.
Drawn	Job No. 05-78-01

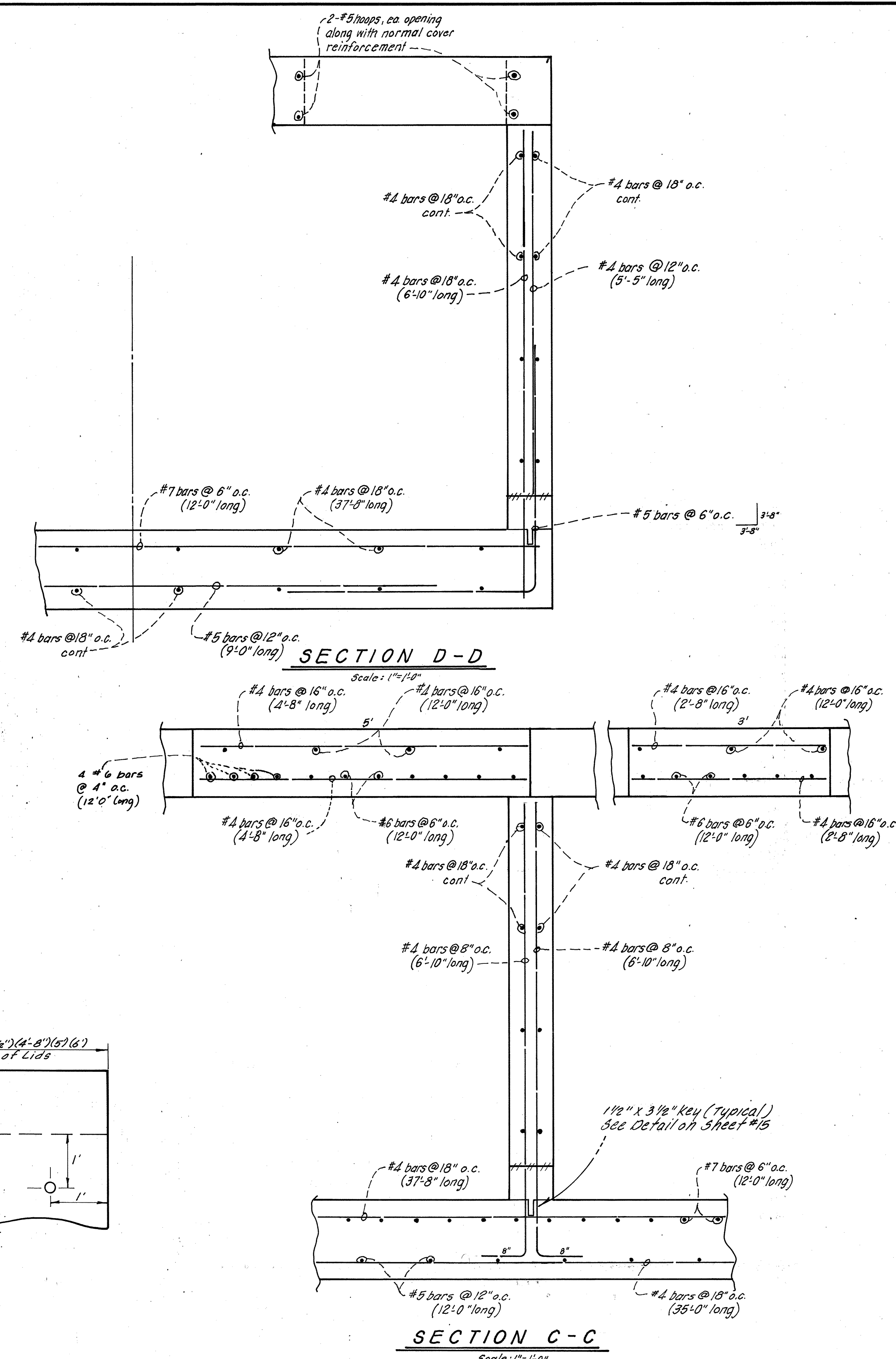
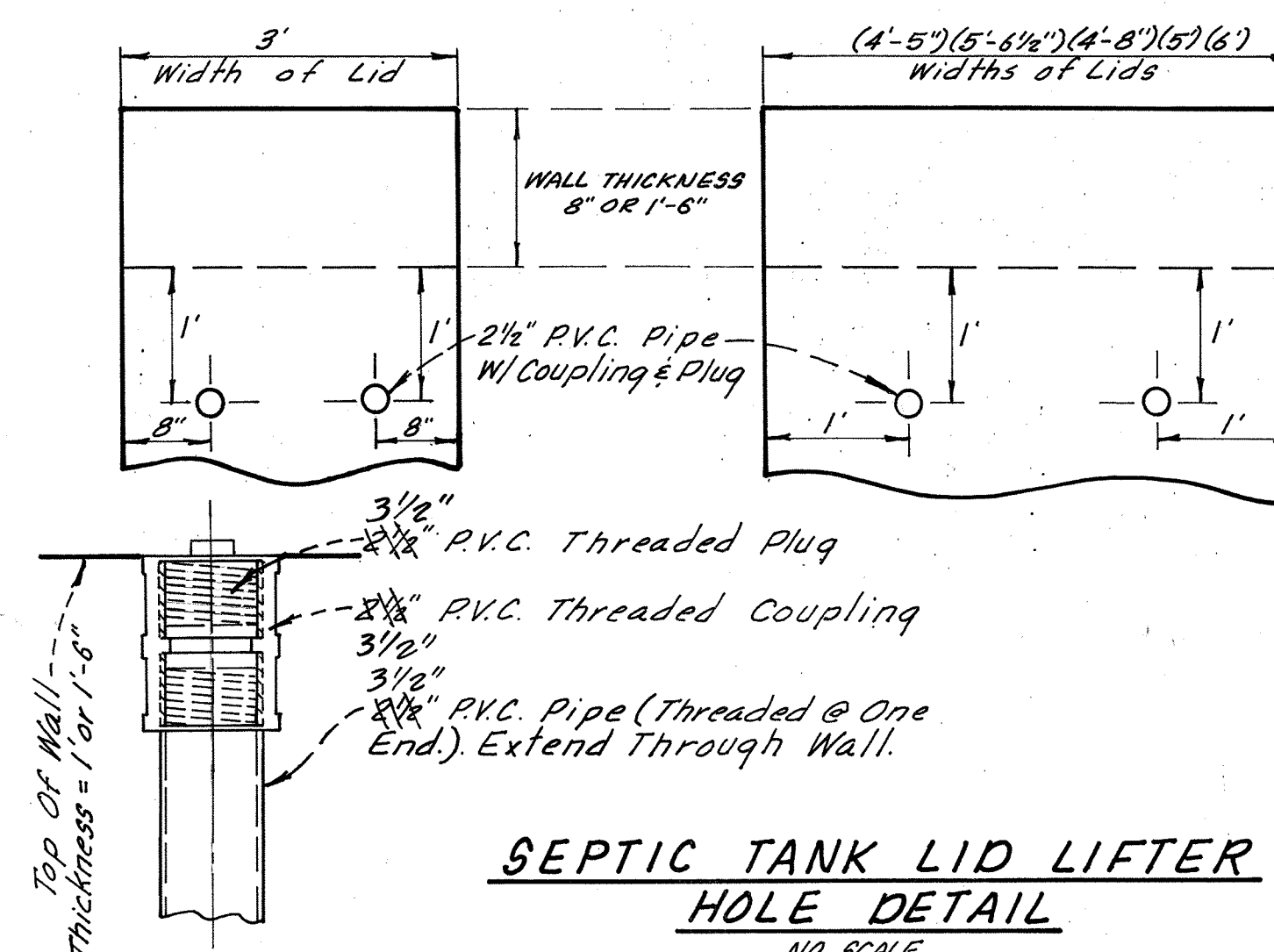
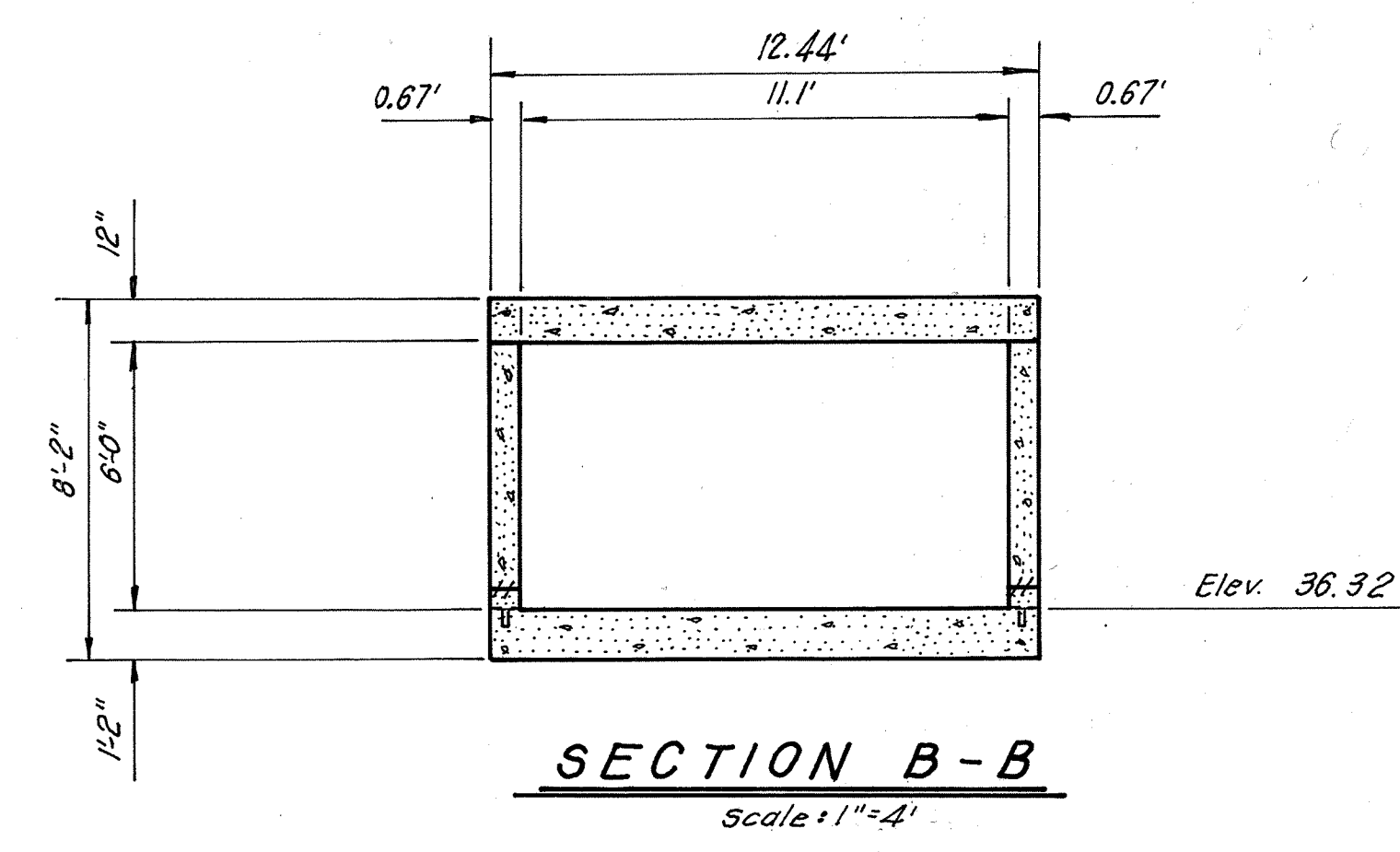
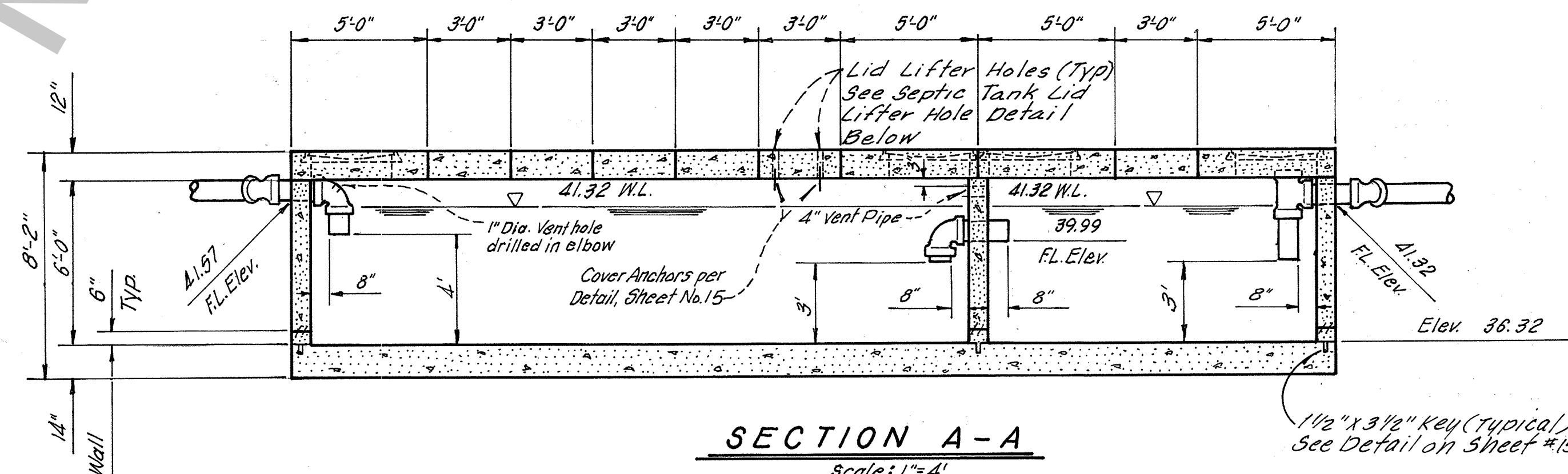
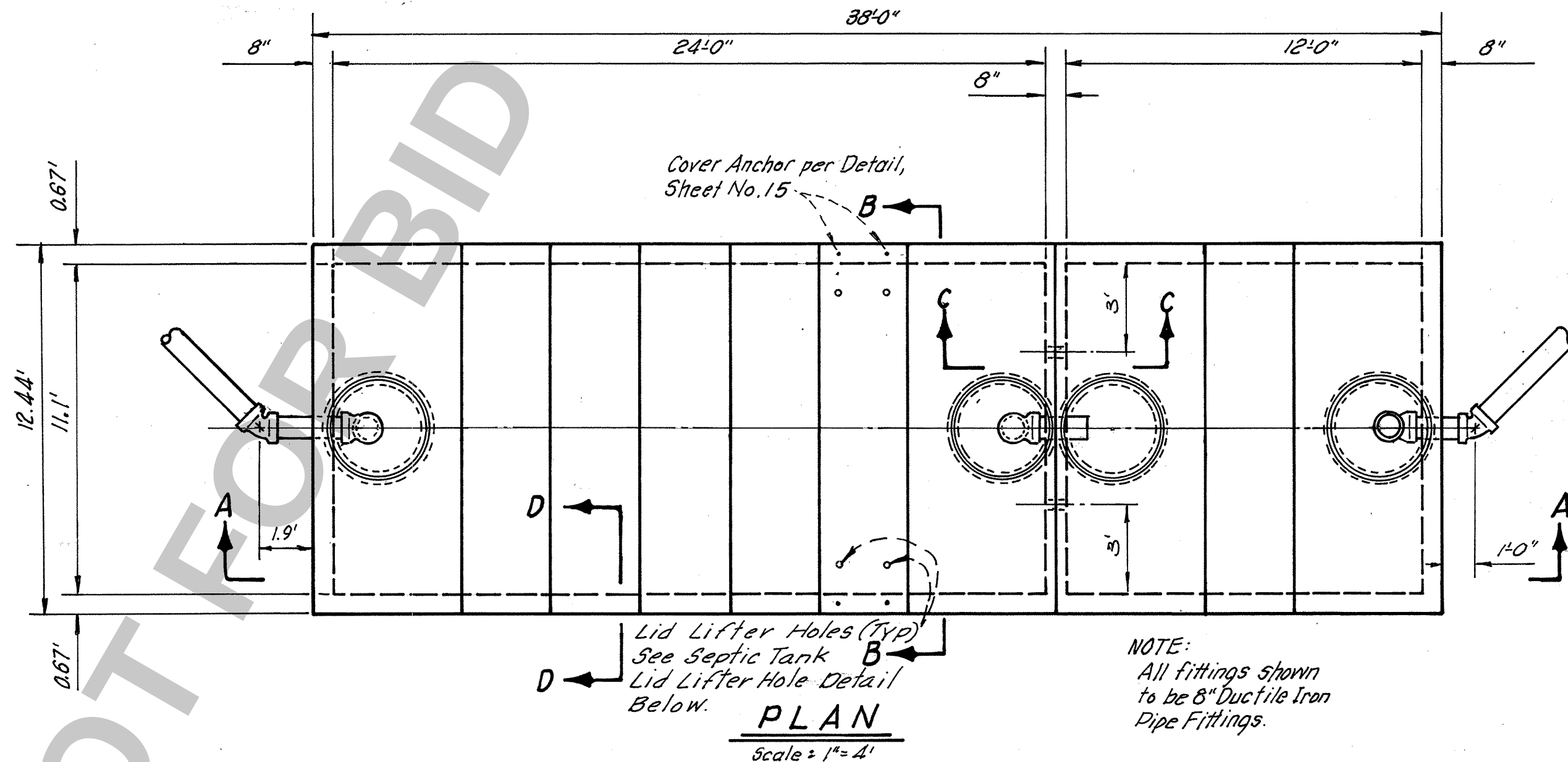
cm ENGINEERING ASSOCIATES

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Phone (714) 884-8804 or (714) 825-9562
225 East Airport Drive, San Bernardino, California

COUNTY OF SAN BERNARDINO
COUNTY SERVICE AREA 82
WASTEWATER FACILITIES

SEARLES VALLEY
TRONA SEPTIC TANK

Sheet 15 of 19
Dwg. No.



Revision	No.	By	Date	Appr.
Revised to "AS BUILT" Conditions	1	W.S.	11-18-80	RF

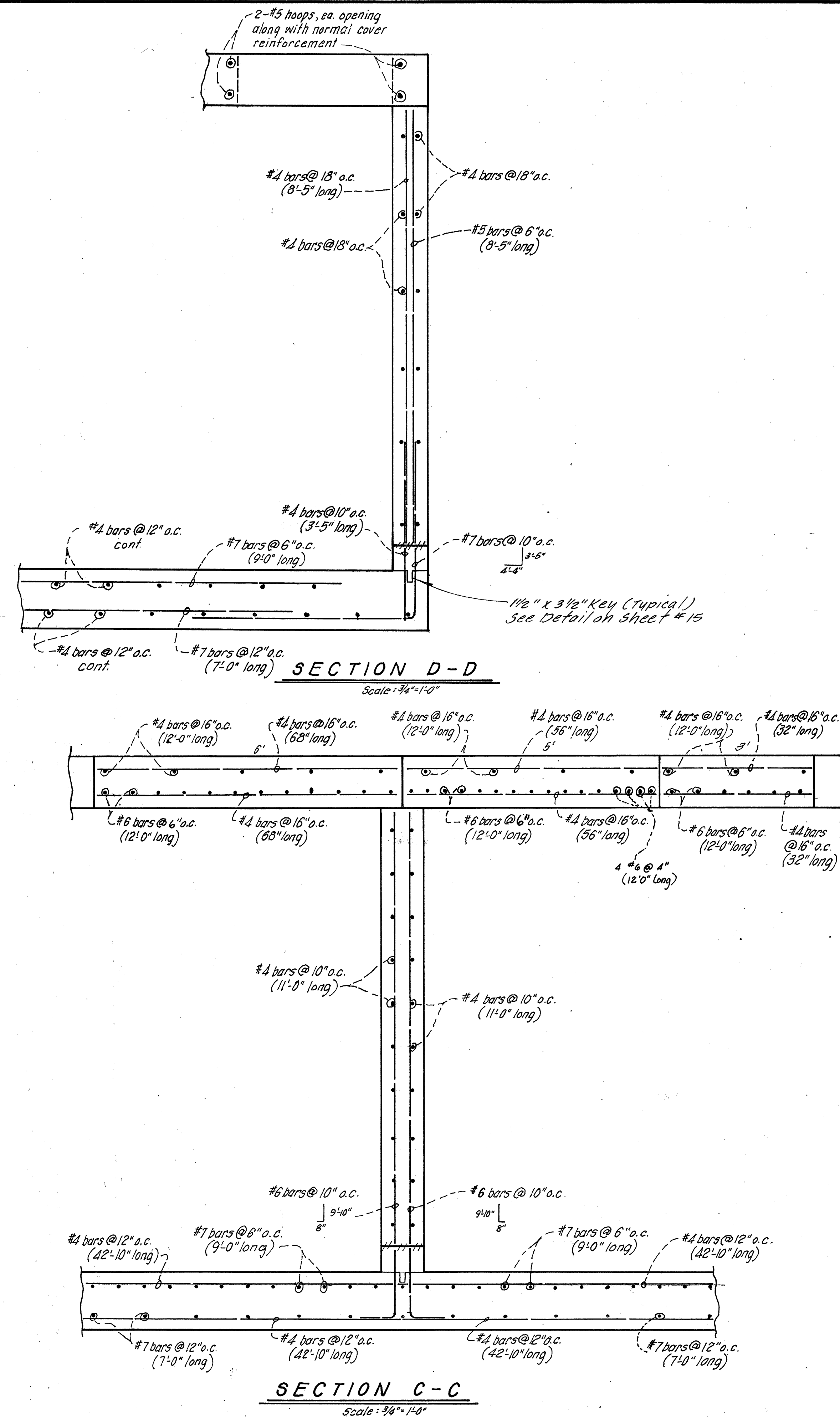
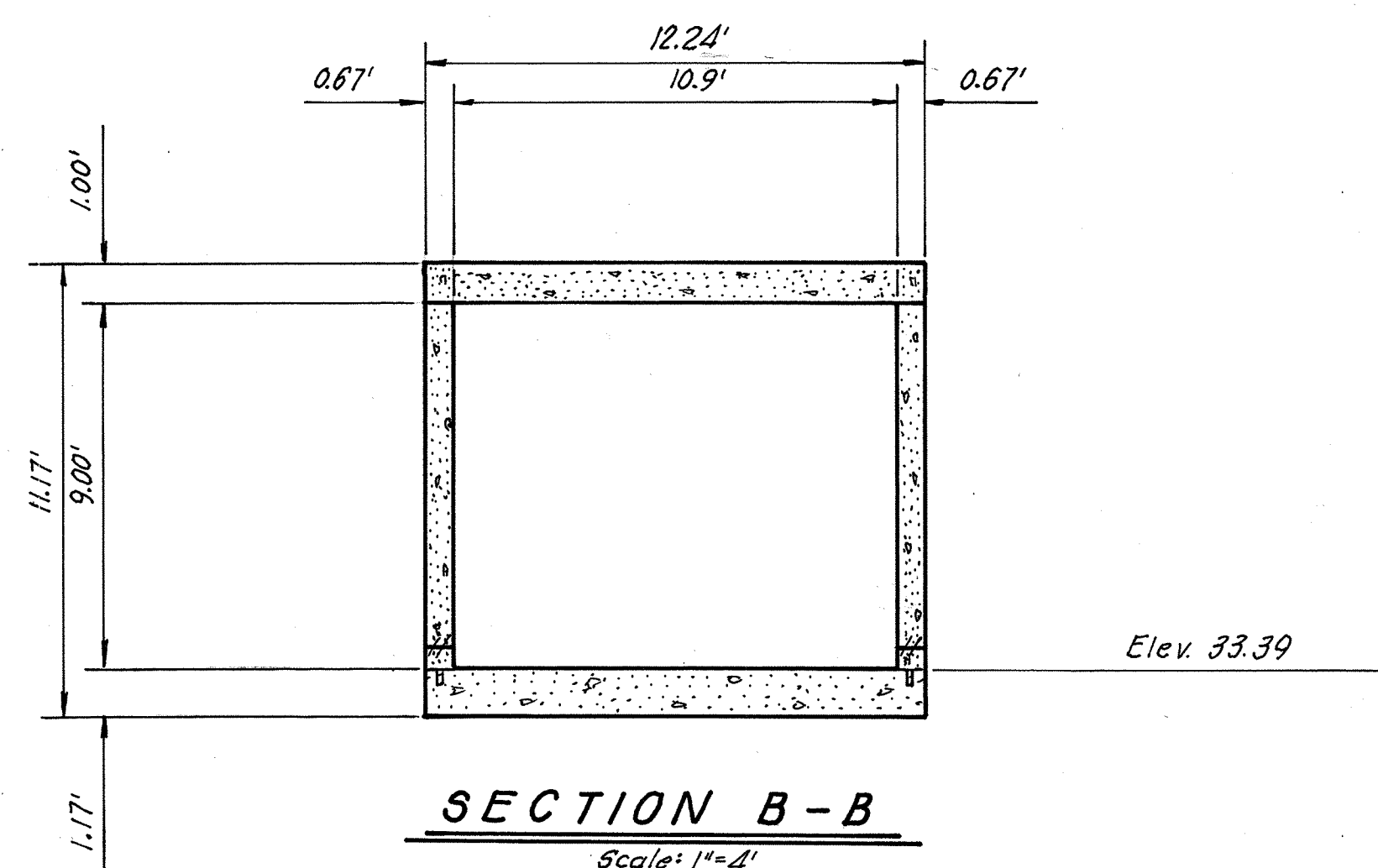
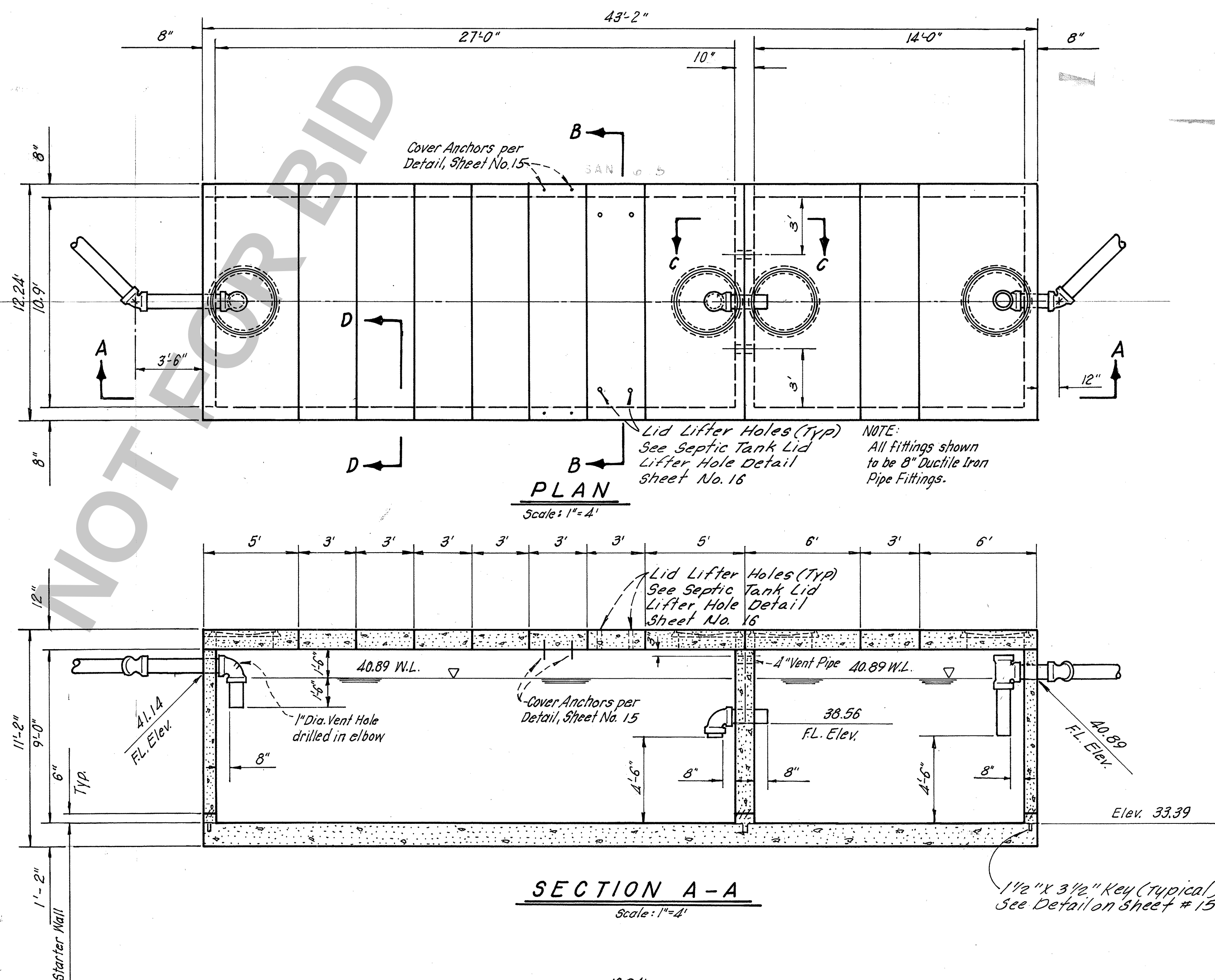
Submitted By:	2/23/77
R.C.E. No. 27,485	Date
Designed R.L. Forester & R. Leja	Checked J.R.D.
Drawn	Job No. 05-78-01

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COUNTY OF SAN BERNARDINO
 COUNTY SERVICE AREA 82
 WASTEWATER FACILITIES

SEARLES VALLEY
 SOUTH SEPTIC TANK
 PIONEER POINT

Sheet 16 of 19
 Sheets
 Dwg. No.



NOTE: ALL CONCRETE ON THIS SHEET TO BE CLASS I

REVIS
TO "AS BUILT"
CONDITIONS
Date 11-18-82

Revision	No.	By	Date	Appr.
Revised to "As Built" Conditions	1	W.B.	11-18-82	R.F.

Submitted By:	Date
R. C. E. No. 27,465	2/23/79
Designed R. Forester & R. Leja	Checked J. R. D.
Drawn	Job No. 05-78-01

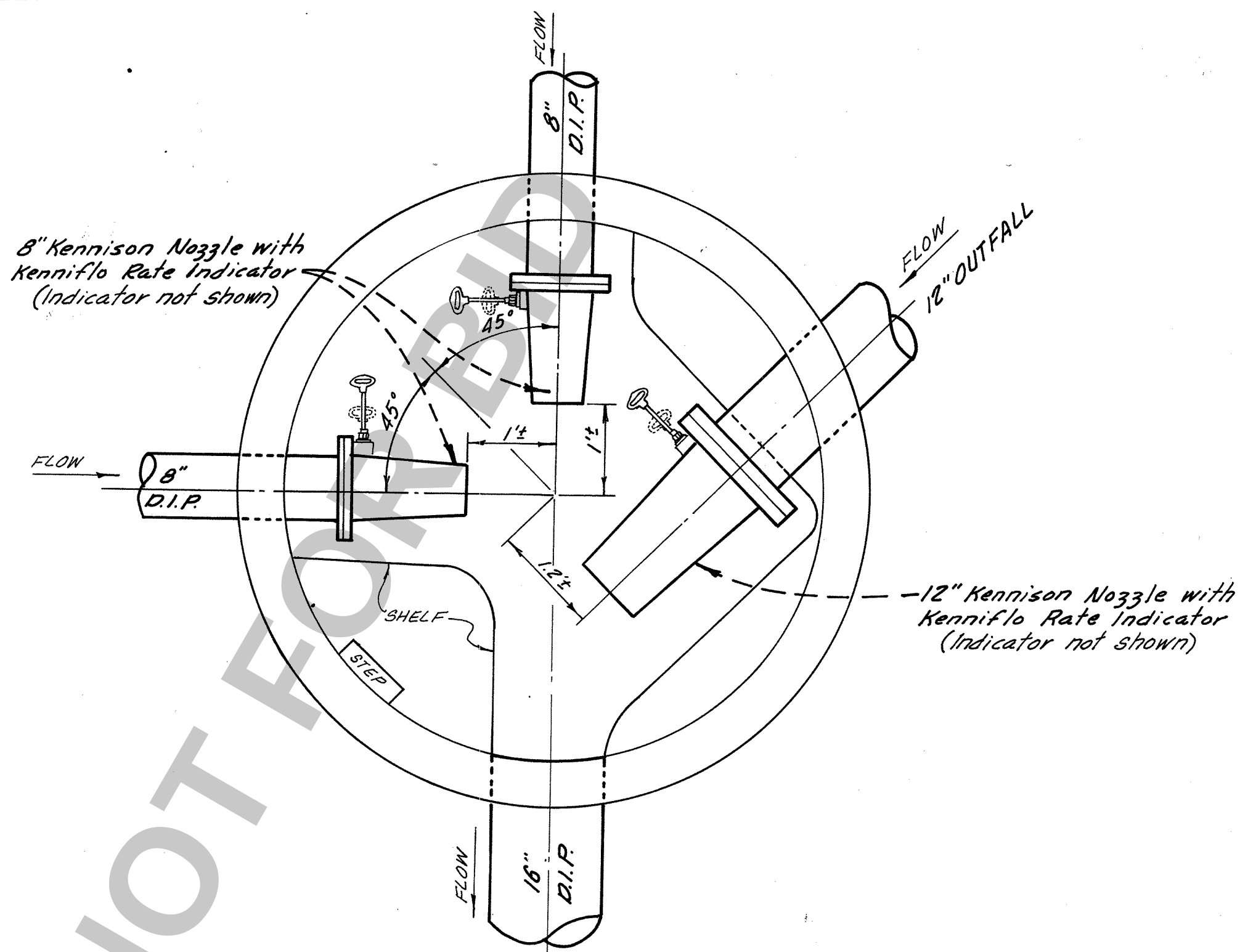
ENGINEERING ASSOCIATES
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Phone (714) 884-8804 or (714) 825-9562
225 East Airport Drive, San Bernardino, California

COUNTY OF SAN BERNARDINO
COUNTY SERVICE AREA 82
WASTEWATER FACILITIES

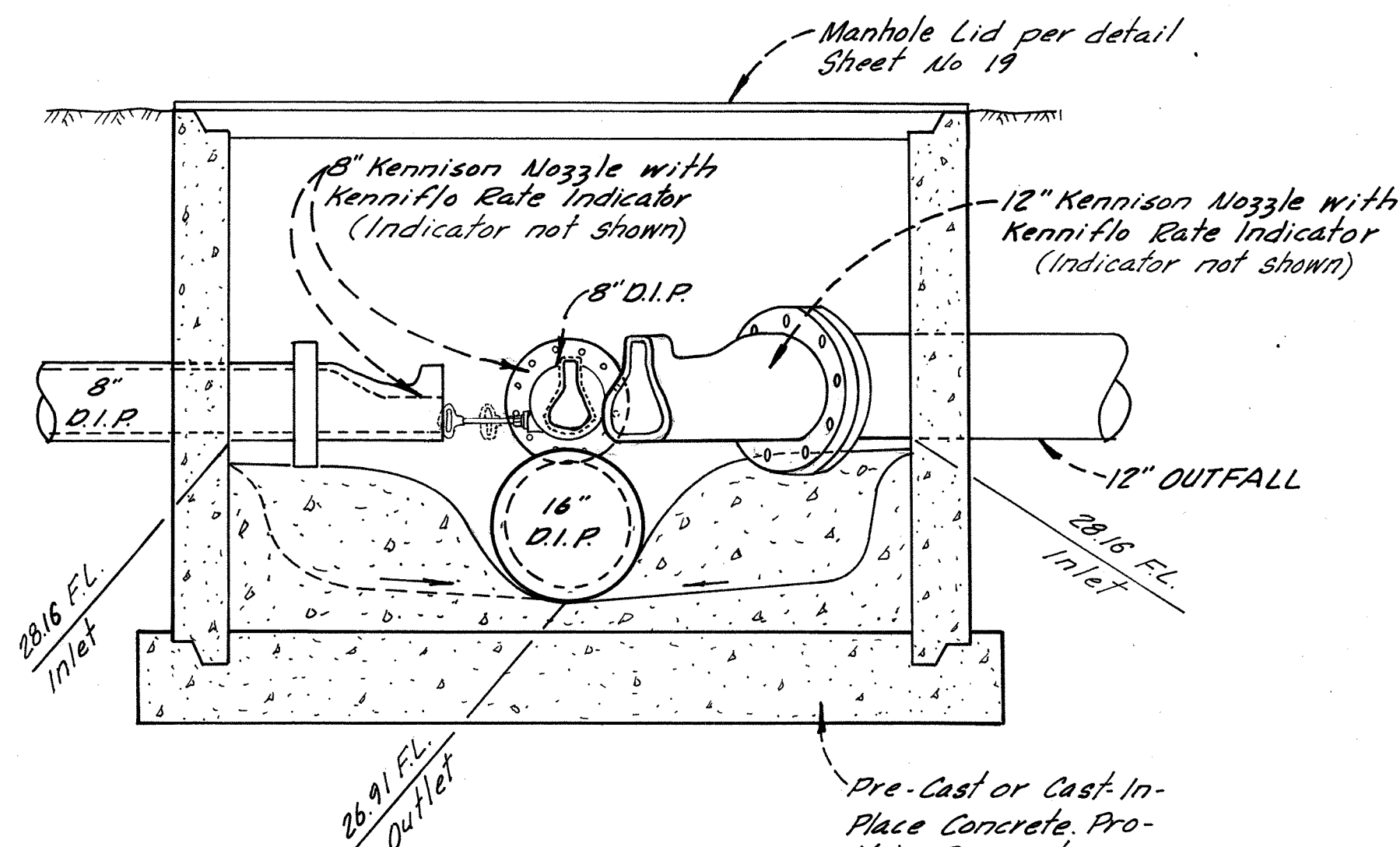
SEARLES VALLEY
NORTH SEPTIC TANK
PIONEER POINT

Sheet 7
of 19
Sheets
Dwg. No.

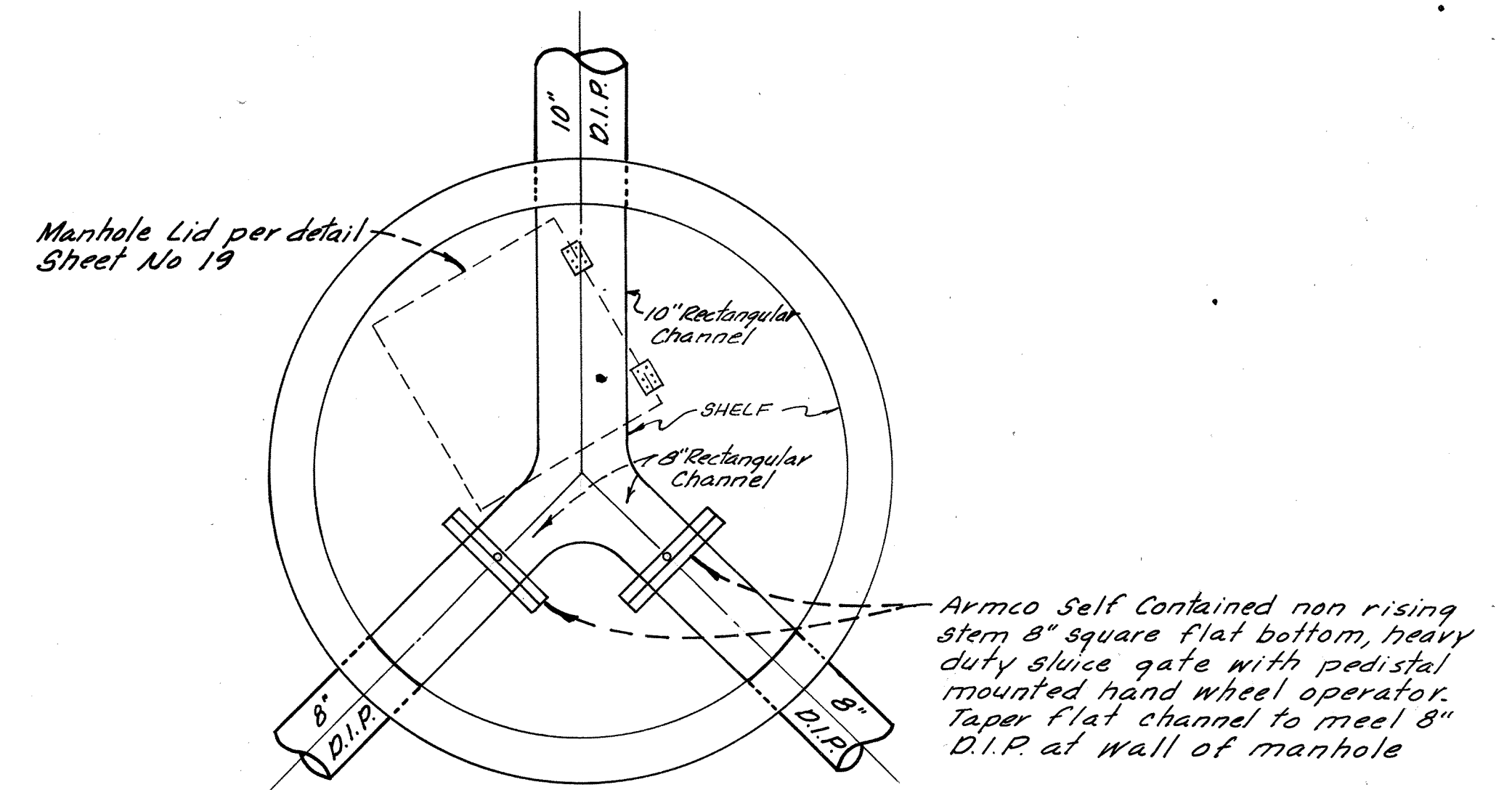
5-78-01 (272)



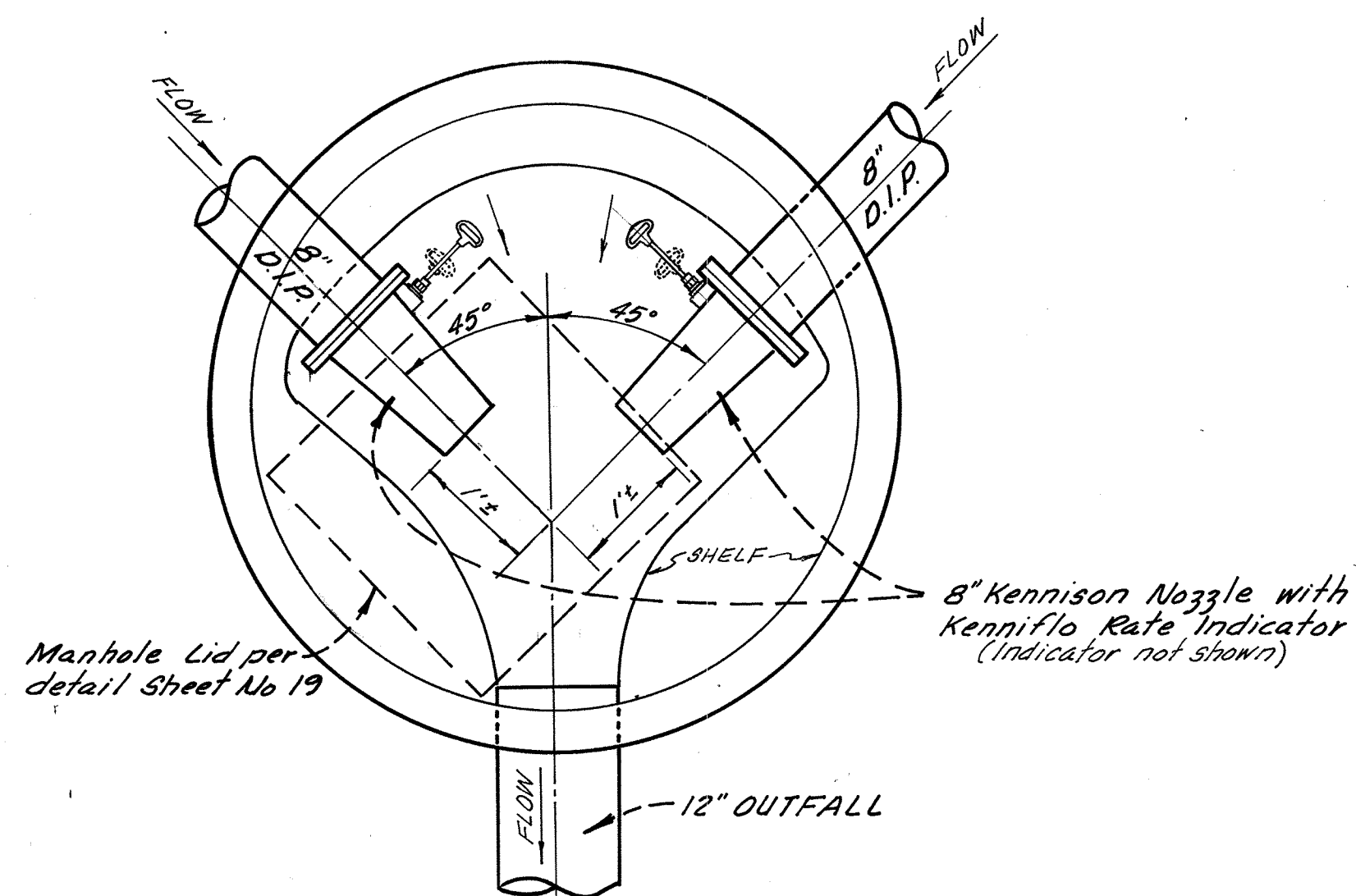
TRONA SEPTIC TANK
OUTLET MANHOLE No 23
6' INSIDE DIAMETER



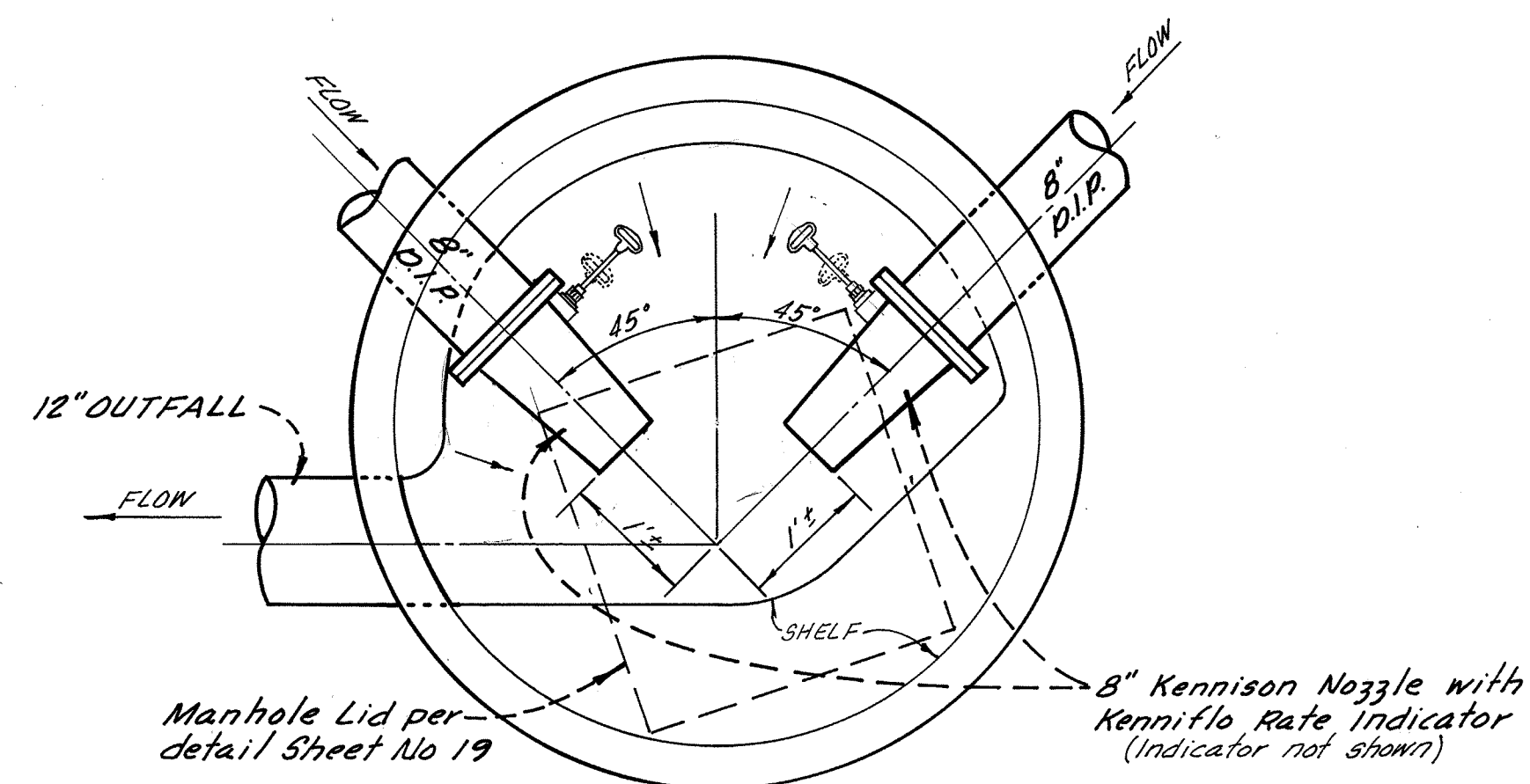
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OUTLET MANHOLE No 23
6' INSIDE DIAMETER



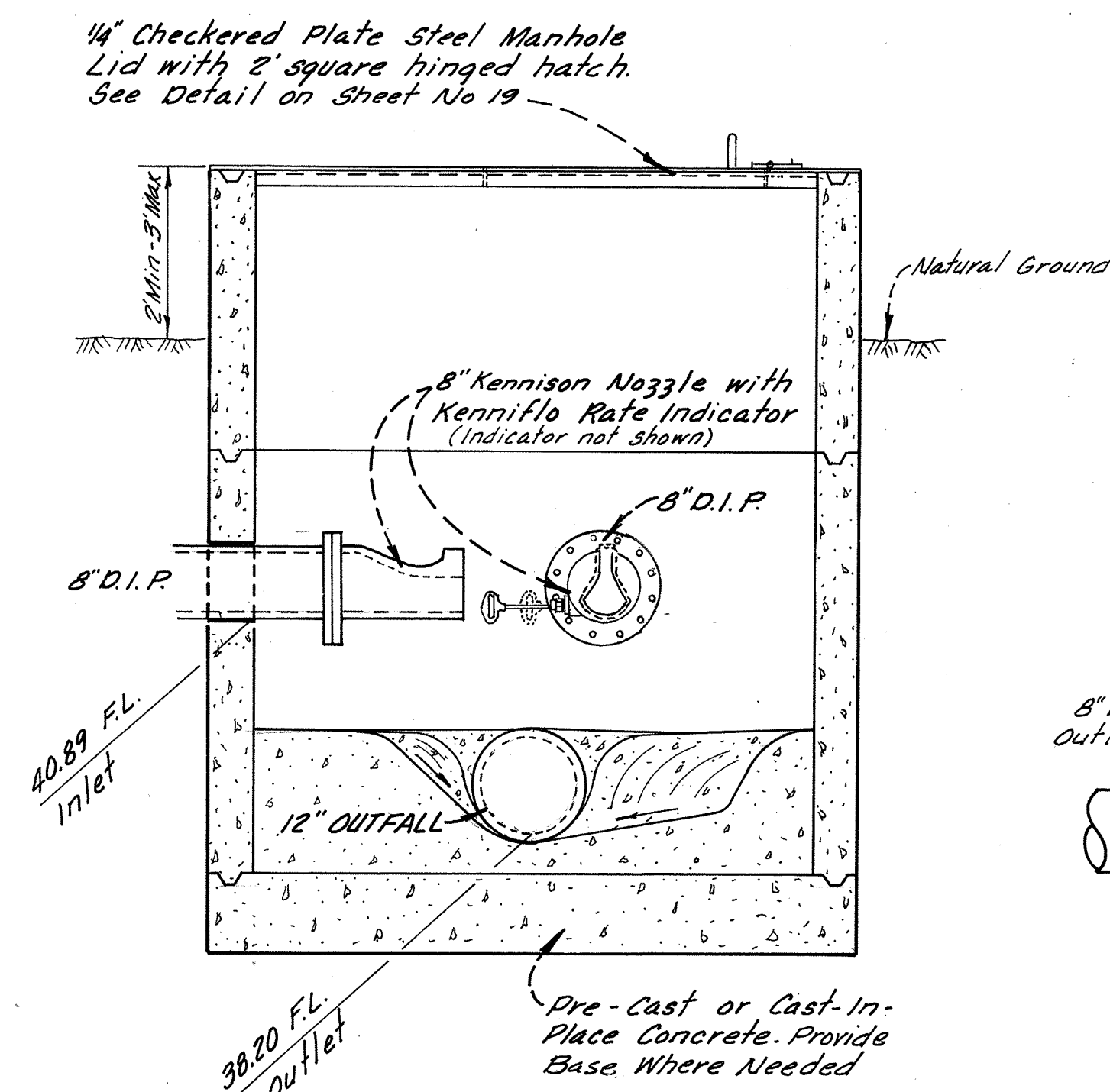
TRONA SEPTIC TANK
INLET MANHOLE No 22
5' INSIDE DIAMETER



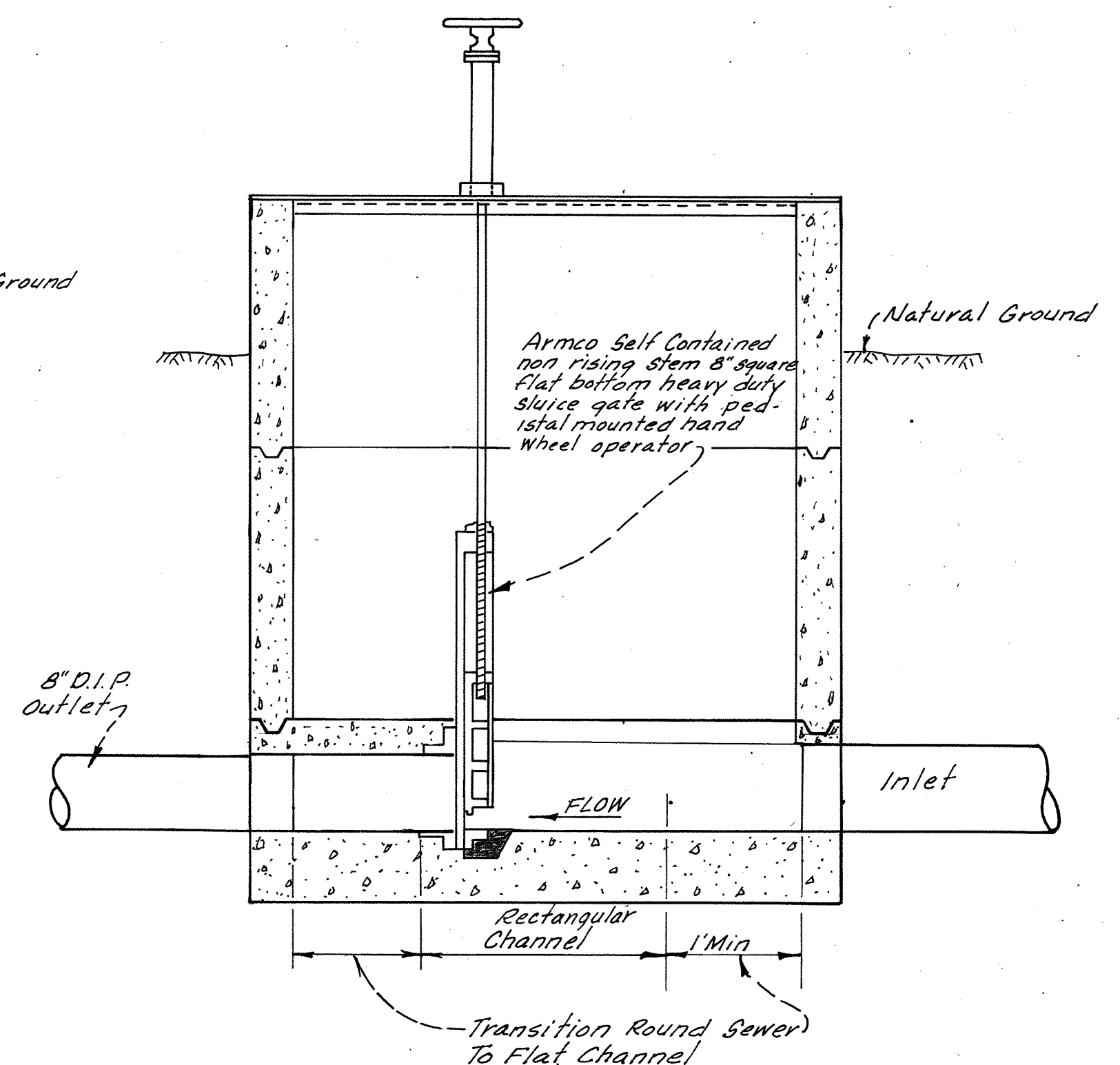
SOUTH SEPTIC TANK
OUTLET MANHOLE No 52
5' INSIDE DIAMETER



NORTH SEPTIC TANK
OUTLET MANHOLE No 43
5' INSIDE DIAMETER



NORTH SEPTIC TANK
OUTLET MANHOLE No 43
5' INSIDE DIAMETER



SLUICE GATE DETAIL

REVIS
TO "AS BUILT"
CONDITIONS
Date 11-18-82

Revision	No.	By	Date	Appr.
Revised to "AS BUILT" Conditions	1	WS	11-18-82	RF

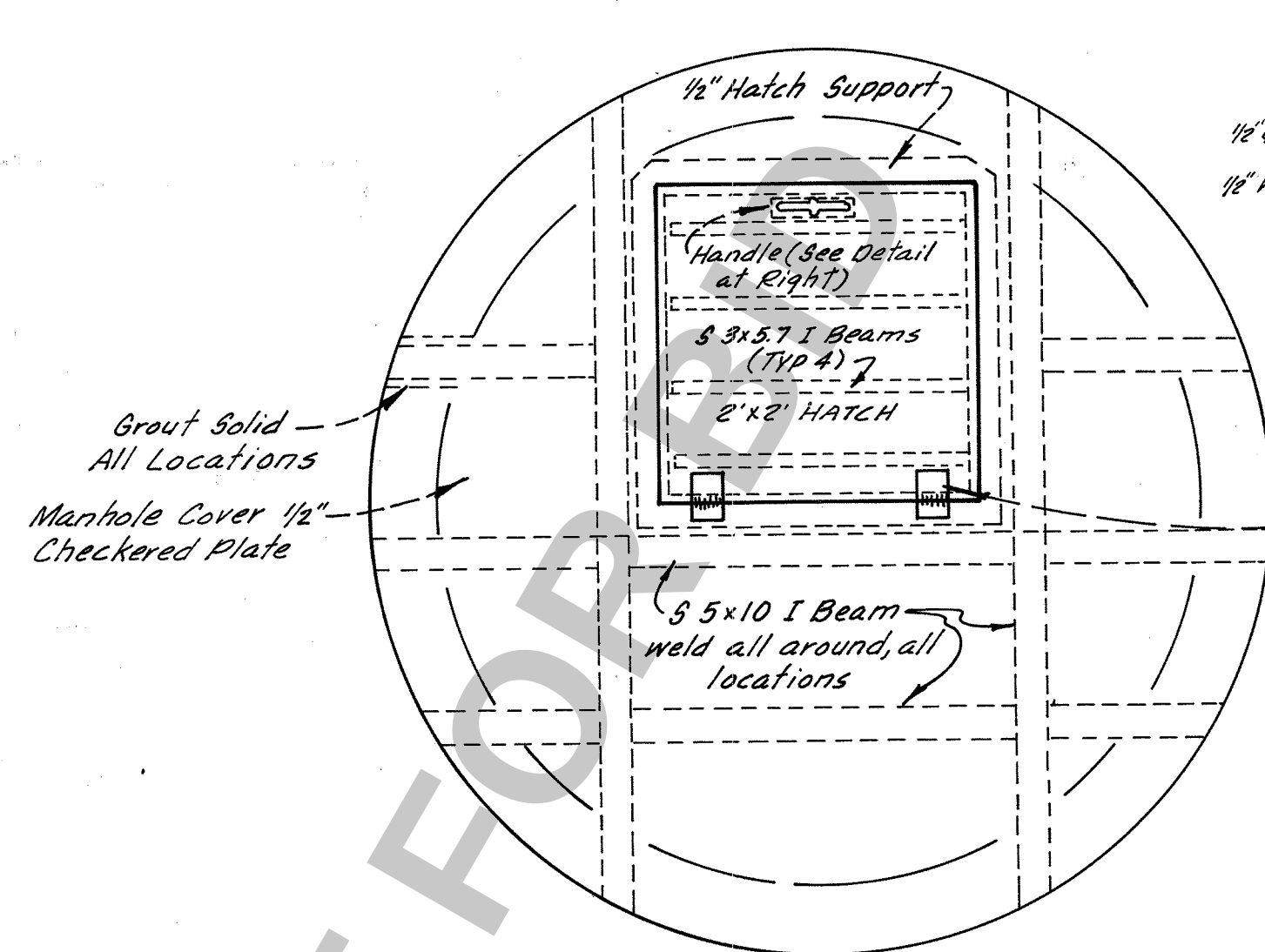
Submitted By:		Date	
R. C. E. No. 27,485		2/23/79	
Designed E. Shaw & P. Leja	Checked J. R. D.		
Drawn	Job No. 05-78-01		

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Mail P.O. Box 6087 - 92412
Phone (714) 854-8804 or (714) 825-9562
225 East Airport Drive, San Bernardino, California

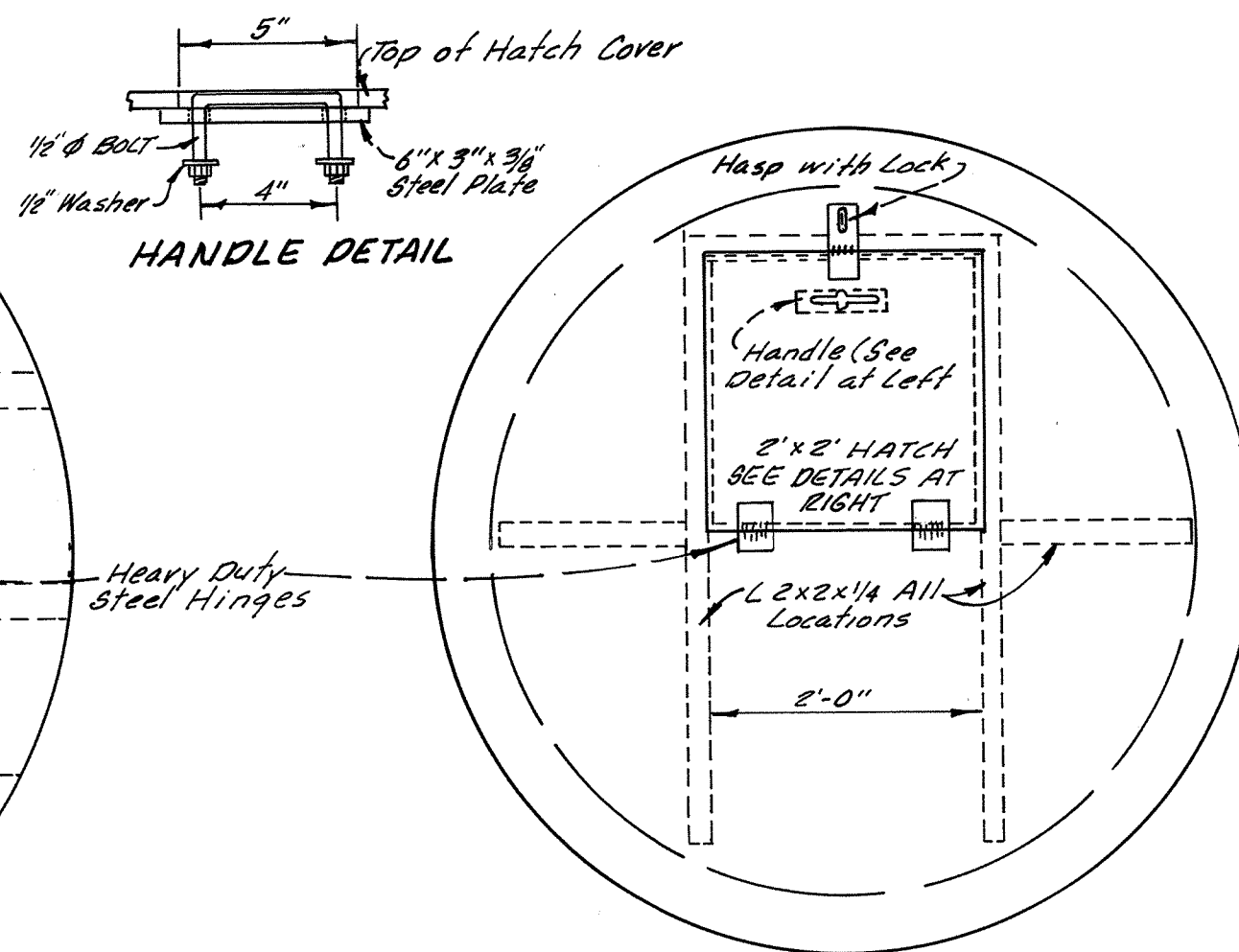
COUNTY OF SAN BERNARDINO
COUNTY SERVICE AREA 82
WASTEWATER FACILITIES

SEARLES VALLEY
MANHOLE DETAILS

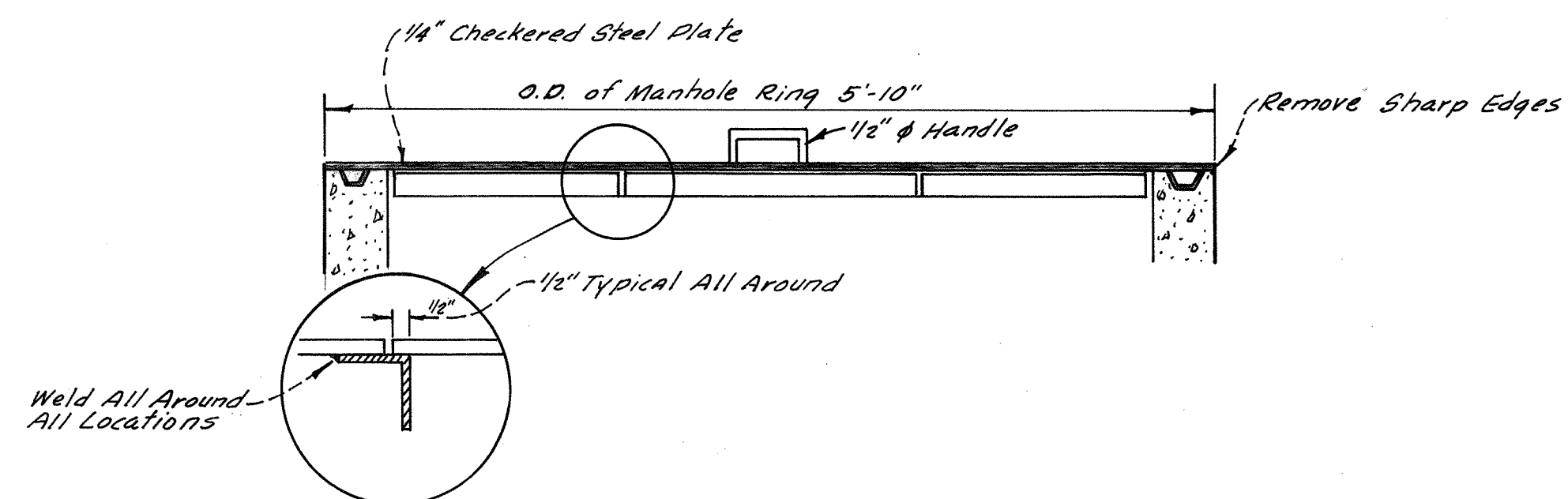
Sheet 18
of 19
Sheets
Dwg. No.



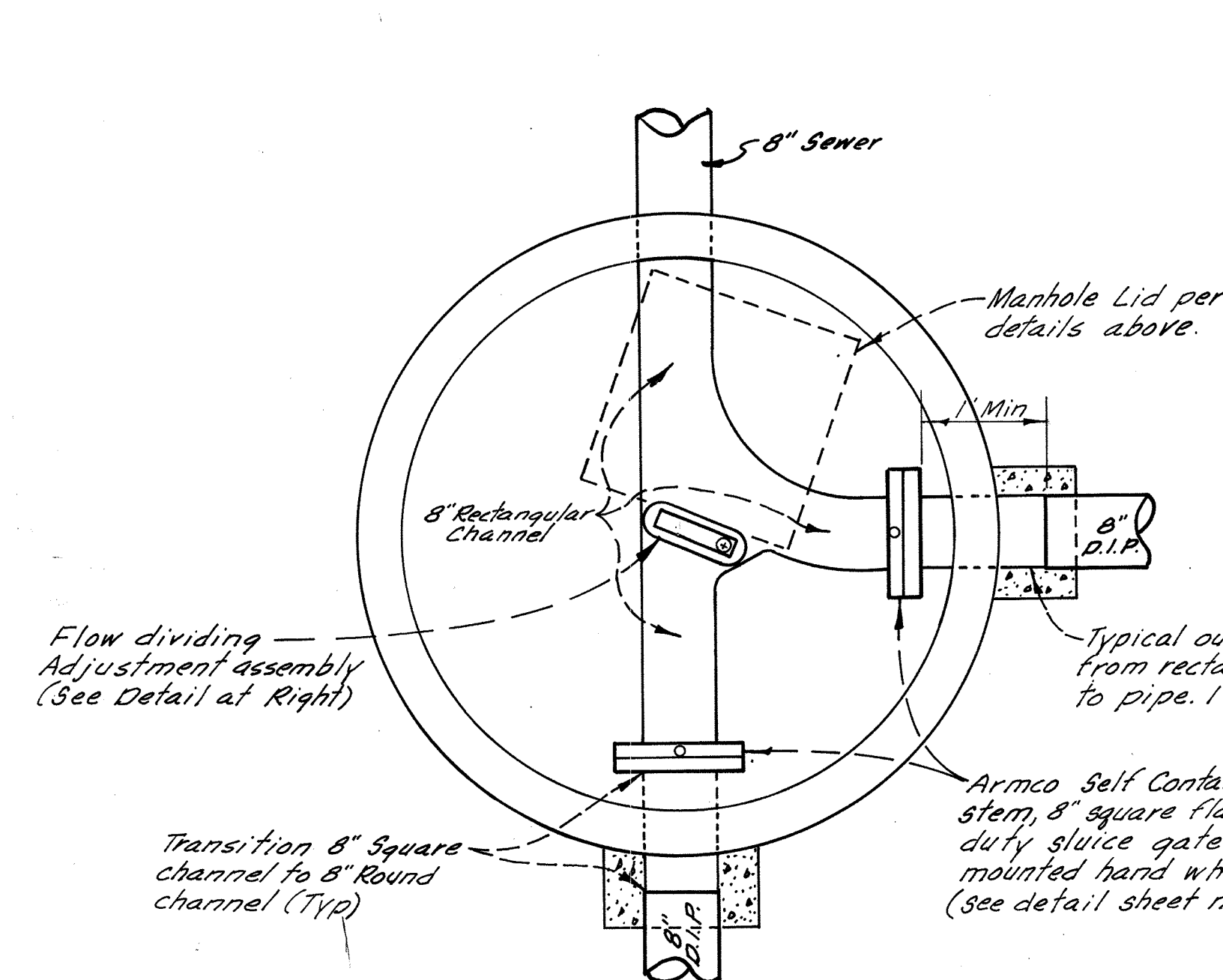
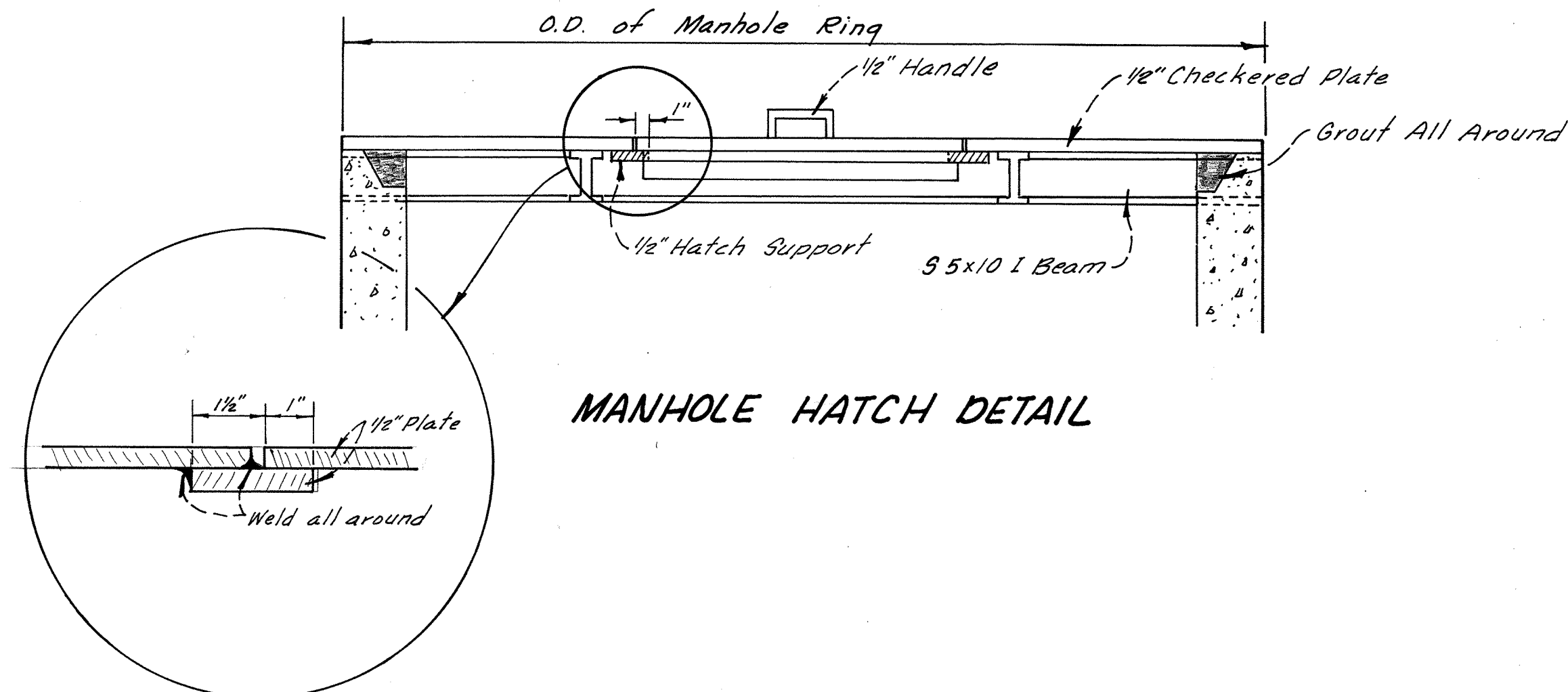
MANHOLE COVER DETAIL
OUTLET MANHOLE No 23
6' INSIDE DIAMETER



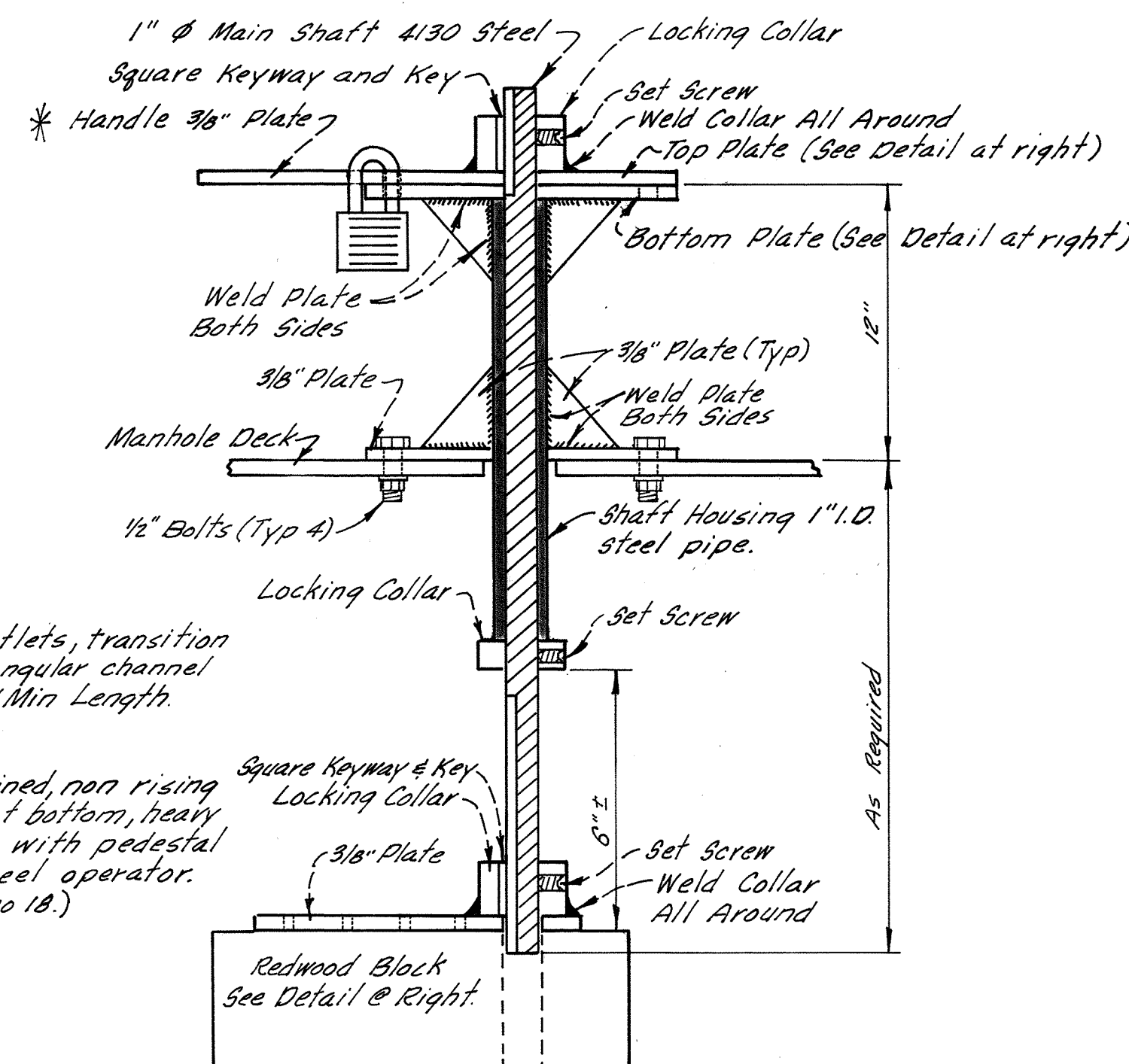
MANHOLE COVER DETAIL
INLET MANHOLE No 48&51
5' INSIDE DIAMETER



MANHOLE HATCH DETAIL



SOUTH SEPTIC TANK
NORTH SEPTIC TANK
INLET MANHOLE No 48&51
5' INSIDE DIAMETER



FLOW DIVIDING ASSEMBLY DETAIL

* Note: Handle bent up @ 90° to clear manhole cover in open position.

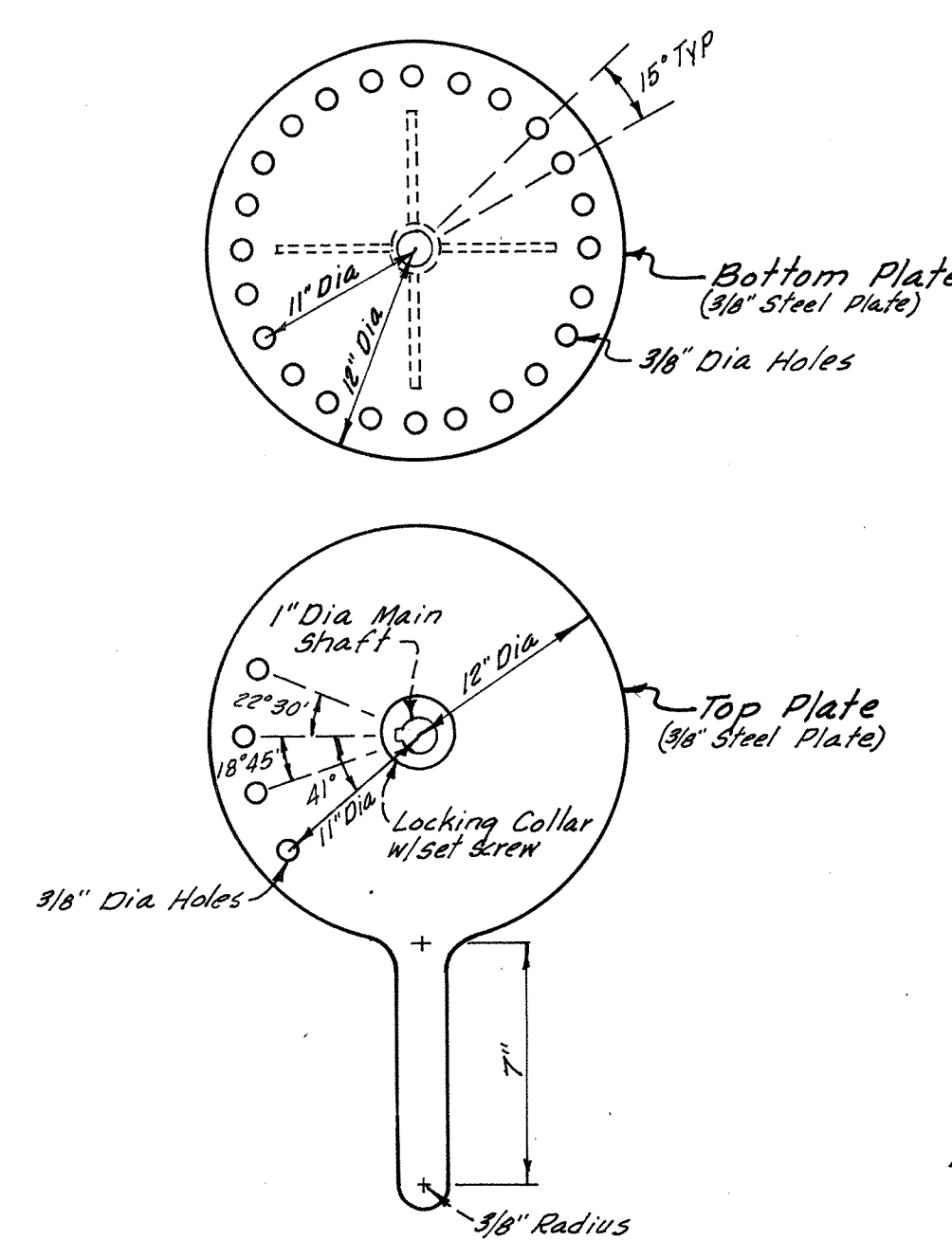
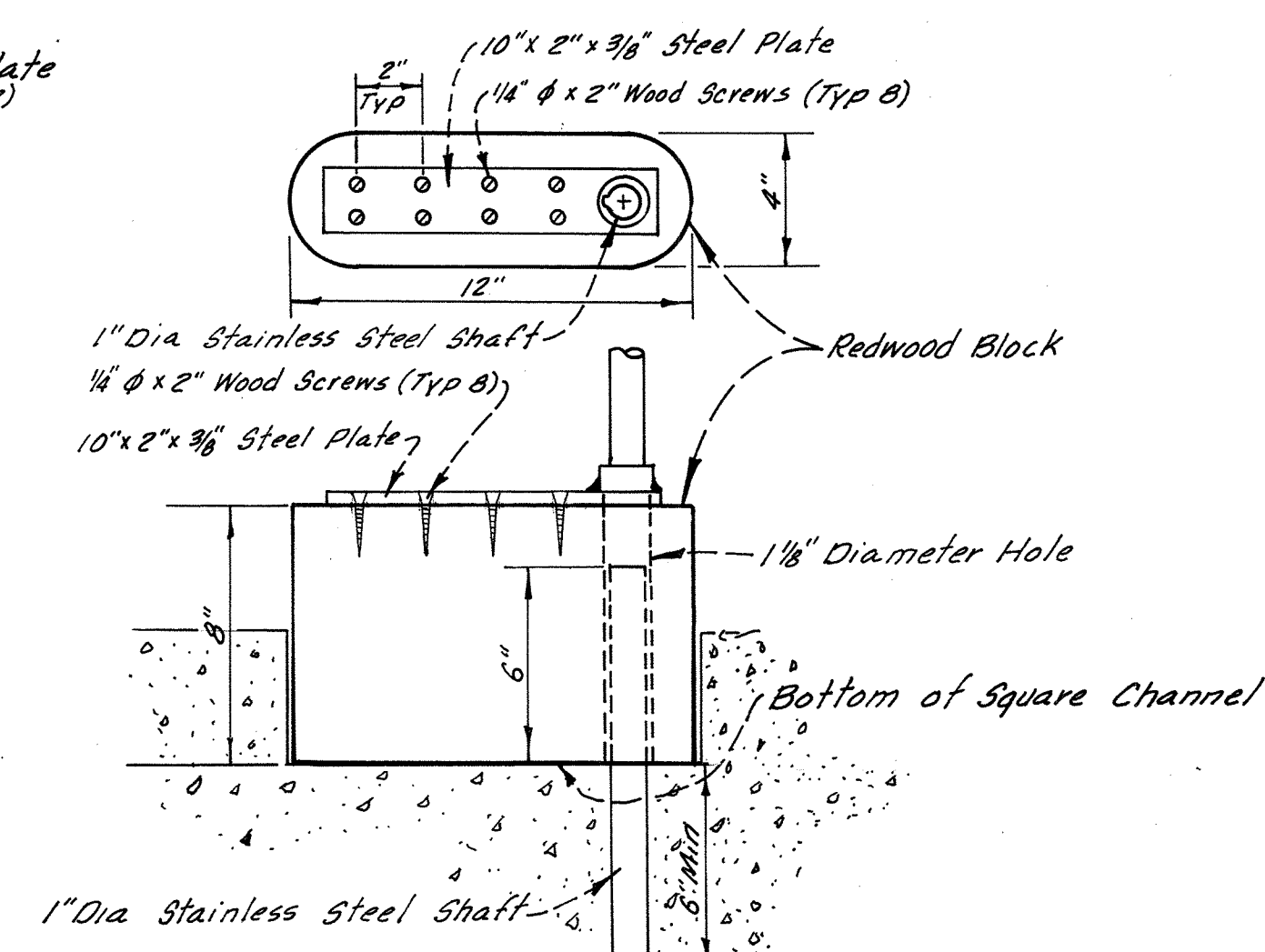


PLATE DETAIL



BLOCK ASSEMBLY DETAIL

REVIS
TO "AS BUILT"
CONDITIONS
Date 11-18-80

Revision	No.	By	Date	Appr.
Revised to "AS BUILT" Conditions	1	WS	11-18-80	RF

Submitted By:	2/23/79
R. C. E. No. 27,485	Date
Designed E. Shaw & P. Leja	Checked J. R. D.
Drawn	Job No. 05-78-01

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Phone (714) 884-8804 or (714) 825-9562
225 East Airport Drive, San Bernardino, California

COUNTY OF SAN BERNARDINO
COUNTY SERVICE AREA 82
WASTEWATER FACILITIES

SEARLES VALLEY
MANHOLE DETAILS

Sheet 19
of 19
Sheets
Dwg. No.

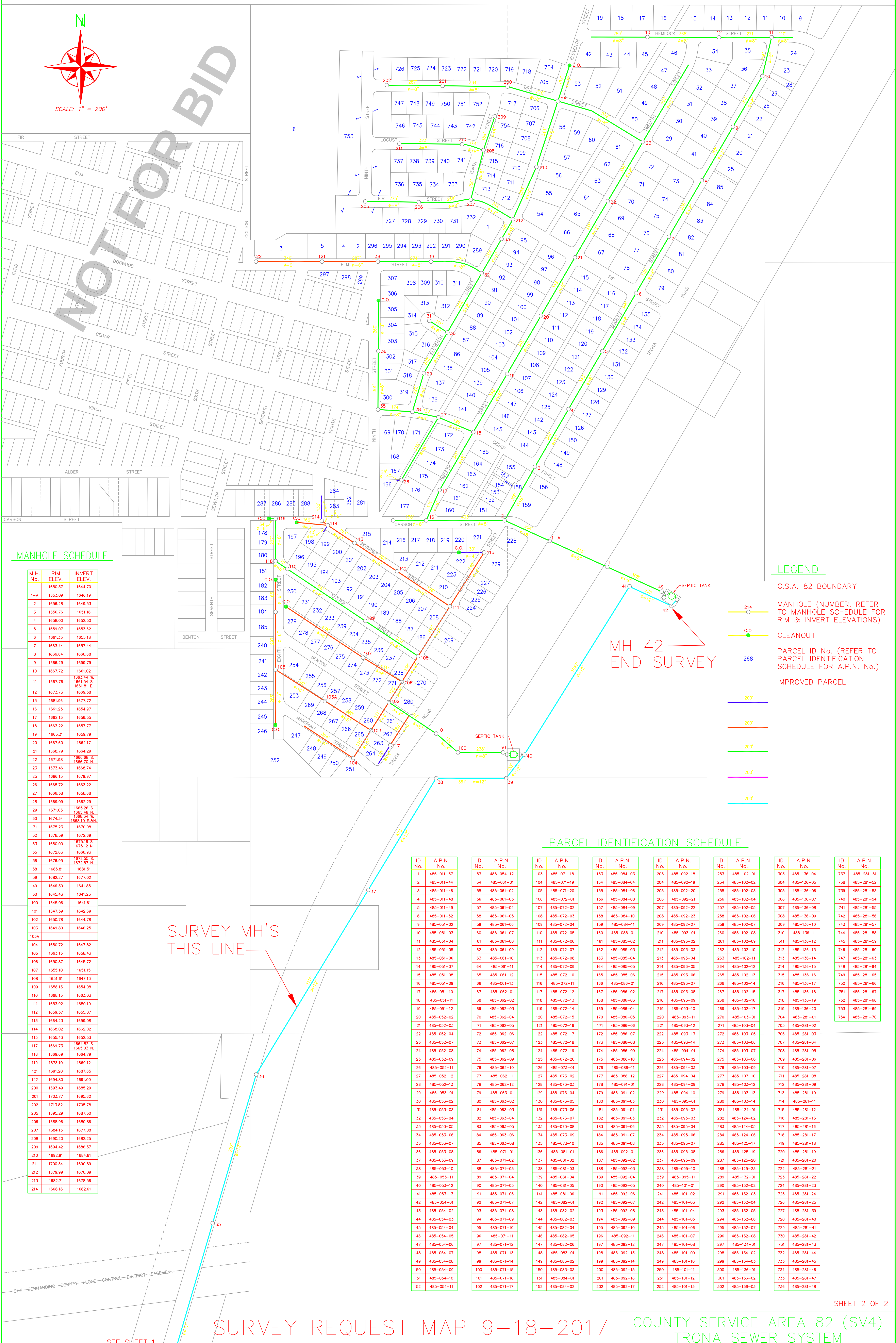
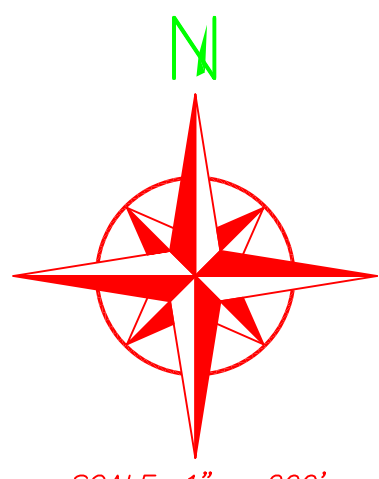
ATTACHMENT 4 – ESTIMATED PIPE SLOPES & MANHOLE SPACING

MANHOLE TABLES

NOT FOR BID

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NOT FOR BID



MANHOLE SCHEDULE

M.H. No.	RIM ELEV.	INVERT ELEV.
1	1650.37	1644.70
1-A	1653.09	1646.19
2	1656.28	1649.53
3	1656.76	1651.16
4	1658.00	1652.50
5	1659.07	1653.62
6	1661.33	1655.18
7	1663.44	1657.44
8	1666.64	1660.68
9	1666.29	1659.79
10	1667.72	1661.02
11	1667.76	1663.44 W. 1661.54 S. 1661.91 E.
12	1673.73	1669.58
13	1681.96	1677.72
16	1661.25	1654.97
17	1662.13	1656.55
18	1663.22	1657.77
19	1665.31	1659.79
20	1667.60	1662.17
21	1668.79	1664.29
22	1671.98	1666.68 S. 1666.70 N.
23	1673.46	1668.74
25	1686.13	1679.97
26	1665.72	1663.22
27	1666.38	1658.68
28	1669.09	1662.29
29	1671.03	1665.26 S. 1665.46 W. 1668.34 W. 1668.10 S.&N.
30	1674.34	1670.08
31	1675.23	1672.69
32	1678.59	1675.18 S. 1675.12 N.
33	1680.00	1672.63
35	1672.63	1666.93
36	1676.95	1672.55 S. 1672.57 N.
38	1685.81	1681.51
39	1682.27	1677.02
49	1646.30	1641.85
50	1645.43	1641.23
100	1645.06	1641.61
101	1647.59	1642.69
102	1650.78	1644.78
103	1649.80	1646.25
103A		
104	1650.72	1647.82
105	1663.13	1658.43
106	1650.87	1645.72
107	1655.10	1651.15
108	1651.61	1647.13
109	1658.13	1654.08
110	1668.13	1663.03
111	1653.92	1650.10
112	1659.37	1655.07
113	1664.23	1659.08
114	1668.02	1662.02
115	1655.43	1652.53
117	1669.73	1664.82 S. 1665.93 N.
118	1669.69	1664.79
119	1673.10	1669.12
121	1691.20	1687.65
122	1694.80	1691.00
200	1693.49	1685.29
201	1703.77	1695.62
202	1713.82	1705.78
205	1695.29	1687.30
206	1688.96	1680.86
207	1684.13	1677.08
208	1690.20	1682.25
209	1694.42	1686.37
210	1692.91	1684.81
211	1700.34	1690.89
212	1679.99	1676.09
213	1682.71	1678.56
214	1668.16	1662.61

LEGEND

- C.S.A. 82 BOUNDARY
- MANHOLE (NUMBER, REFER TO MANHOLE SCHEDULE FOR RIM & INVERT ELEVATIONS)
- CLEANOUT
- PARCEL ID No. (REFER TO PARCEL IDENTIFICATION SCHEDULE FOR A.P.N. No.)
- IMPROVED PARCEL
- 200'
- 200'
- 200'
- 200'
- 200'
- 200'

PARCEL IDENTIFICATION SCHEDULE

ID No.	A.P.N. No.	ID No.	A.P.N. No.	ID No.	A.P.N. No.	ID No.	A.P.N. No.	ID No.	A.P.N. No.	ID No.	A.P.N. No.
1	485-011-37	53	485-054-12	103	485-071-18	153	485-084-03	203	485-092-18	253	485-102-01
2	485-011-44	54	485-061-01	104	485-071-19	154	485-084-04	204	485-092-19	254	485-102-02
3	485-011-46	55	485-061-02	105	485-071-20	155	485-084-05	205	485-092-20	255	485-102-03
4	485-011-48	56	485-061-03	106	485-072-01	156	485-084-06	206	485-092-21	256	485-102-04
5	485-011-49	57	485-061-04	107	485-072-02	157	485-084-07	207	485-092-22	257	485-102-05
6	485-011-52	58	485-061-05	108	485-072-03	158	485-084-08	208	485-092-23	258	485-102-06
9	485-051-02	59	485-061-06	109	485-072-04	159	485-084-09	209	485-092-24	259	485-102-07
10	485-051-03	60	485-061-07	110	485-072-05	160	485-085-01	210	485-093-01	260	485-102-08
11	485-051-04	61	485-061-08	111	485-072-06	161	485-085-02	211	485-093-02	261	485-102-09
12	485-051-05	62	485-061-09	112	485-072-07	162	485-085-03	212	485-093-03	262	485-102-10
13	485-051-06	63	485-061-10	113	485-072-08	163	485-085-04	213	485-093-04	263	485-102-11
14	485-051-07	64	485-061-11	114	485-072-09	164	485-085-05	214	485-093-05	264	485-102-12
15	485-051-08	65	485-061-12	115	485-072-10	165	485-085-06	215	485-093-06	265	485-102-13
16	485-051-09	66	485-061-13	116	485-072-11	166	485-086-01	216	485-093-07	266	485-102-14
17	485-051-10	67	485-062-01	117	485-072-12	167	485-086-02	217	485-093-08	267	485-102-15
18	485-051-11	68	485-062-02	118	485-072-13	168	485-086-03	218	485-093-09	268	485-102-16
19	485-051-12	69	485-062-03	119	485-072-14	169	485-086-04	219	485-093-10	269	485-102-17
20	485-052-02	70	485-062-04	120	485-072-15	170	485-086-05	220	485-093-11	270	485-103-01
21	485-052-03	71	485-062-05	121	485-072-16	171	485-086-06	221	485-093-12	271	485-103-02
22	485-052-04	72	485-062-06	122	485-072-17	172	485-086-07	222	485-093-13	272	485-103-03
23	485-052-07	73	485-062-07	123	485-072-18	173	485-086-08	223	485-093-14	273	485-103-04
24	485-052-08	74	485-062-08	124	485-072-19	174	485-086-09	224	485-094-01	274	485-103-05
25	485-052-09	75	485-062-09	125	485-072-20	175	485-086-10	225	485-094-02	275	485-103-06
26	485-052-11	76	485-062-10	126	485-073-01	176	485-086-11	226	485-094-03	276	485-103-07
27	485-052-12	77	485-062-11	127	485-073-02	177	485-086-12	227	485-094-04	277	485-103-08
28	485-052-13	78	485-062-12	128	485-073-03	178	485-091-01	228	485-094-05	278	485-103-09
29	485-053-01	79	485-063-01	129	485-073-04	179	485-091-02	229	485-094-06	279	485-103-10
30	485-053-02	80	485-063-02	130	485-073-05	180	485-091-03	230	485-095-01	280	485-103-11
31	485-053-03	81	485-063-03	131	485-073-06	181	485-091-04	231	485-095-02	281	485-103-12
32	485-053-04	82	485-063-04	132	485-073-07	182	485-091-05	232	485-095-03	282	485-103-13
33	485-053-05	83	485-063-05	133	485-073-08	183	485-091-06	233	485-095-04	283	485-103-14
34	485-053-06	84	485-063-06	134	485-073-09	184	485-091-07	234	485-095-05	284	485-103-15
35	485-053-07	85	485-063-07	135	485-073-10	185	485-091-08	235	485-095-06	285	485-103-16
36	485-053-08	86	485-071-01	136	485-073-11	186	485-092-01	236	485-095-07	286	485-103-17
37	485-053-09	87	485-071-02	137	485-073-12	187	485-092-02	237	485-095-08	287	485-103-18
38	485-053-10	88	485-071-03	138	485-073-13	188	485-092-03	238	485-095-09	288	485-103-19
39	485-053-11	89	485-071-04	139	485-073-14	189	485-092-04	239	485-095-10	289	485-103-20
40	485-053-12	90	485-071-05	140	485-073-15	190	485-092-05	240	485-101-01	290	485-103-21
41	485-053-13	91	485-071-06	141	485-073-16	191	485-092-06	241	485-101-02	291	485-103-22
42	485-054-01	92	485-071-07	142	485-073-17	192	485-092-07	242	485-101-03	292	485-103-23
43	485-054-02	93	485-071-08	143	485-073-18	193	485-092-08	243	485-101-04	293	485-103-24
44	485-054-03	94	485-071-09	144	485-073-19	194	485-092-09	244	485-101-05	294	485-103-25
45	485-054-04	95	485-071-10	145	485-073-20	195	485-092-10	245	485-101-06	295	485-103-26
46	485-054-05	96	485-071-11	146	485-073-21	196	485-092-11	246	485-101-07	296	485-103-27
47	485-054-06	97	485-071-12	147	485-073-22	197	485-092-12	247	485-101-08	297	485-103-28
48	485-054-07	98	485-071-13	148	485-073-23	198	485-092-13	248	485-101-09	298	485-103-29
49	485-054-08	99	485-071-14	149	485-073-24	199	485-092-14	249	485-101-10	299	485-103-30
50	485-054-09	100	485-071-15	150	485-073-25	200	485-092-15	250	485-101-11	300	485-103-31
51	485-054-10	101	485-071-16	151	485-073-26	201	485-092-16	251	485-101-12	301	485-103-32
52	485-054-11	102	485-071-17	152	485-073-27	202	485-092-17	252	485-101-13	302	485-103-33

SURVEY MH'S THIS LINE

SURVEY REQUEST MAP 9-18-2017

COUNTY SERVICE AREA 82 (SV4) TRONA SEWER SYSTEM

SEE SHEET 1

SEARLES VALLEY EFFLUENT LINE & MANHOLE PRIORITIES:

MH #	MAIN SIZE (INCHES)	DIST TO NEXT IN LF	RUNNING TTL LENGTH IN LF	NOTES	LINE SEGMENT PRIORITY	MANHOLE PRIORITY
25	12	983			2	2
26	12	1,000	1,983	Manhole Replaced 2019	2	3
27	12	997	2,980	Manhole Replaced 2019	2	3
28	12	609	3,589		2	1
29	12	12	3,601		2	1
30	12	565	4,166	Sag parallel to H.S. (no TV)	2	1
31	12	577	4,743	Sag parallel to H.S. (no TV)	2	2
32	12	565	5,308	Sag parallel to H.S. (no TV)	1	1
33	12	816	6,124	To Pioneer Point (Estimated)	1	1
34	12	816	6,940	(Estimated)	1	1
35	12	797	7,737	To Pioneer Point	1	1
36	12	1,111	8,848	Manhole Replaced 2019	1	3
37	12	673	9,521	Manhole Replaced 2019	1	3
38	12	361	9,882	Manhole Replaced 2019	1	3
39	12	153	10,035		1	1
40	12	1047	11,082		1	1
41	12	235	11,317		1	1
42				Ends at 42 Septic Tank	1	1

17

11,317

17 Total Manholes on Effluent Line

SYSTEM NOTES:

All post earthquake repairs televised; some portions of system televised in 2019; unable to televise "sag".

PRIORITY RANKING for PIPE SEGMENTS & MH's:

1 = Needs to be replaced now, condition is bad
 2 = Servicable, but still requires replacment
 3 = Servicalbe

Alternative 1 - Replace in Place

Number of manholes	Manhole	Main Size (inches)	Distance to next Manhole in LF*	Invert**	slope
1	25	12	983	1679.97	-1.70%
2	26	12	1000	1663.22	-0.45%
3	27	12	997	1658.68	0.36%
4	28	12	609	1662.29	0.49%
5	29	12	12	1665.26	23.67%
6	30	12	565	1668.1	0.35%
7	31	12	577	1670.08	0.45%
8	32	12	565	1672.69	0.43%
9	33	12	816	1675.12	
10	34	12	816		
11	35	12	797	1666.93	0.71%
12	36	12	1111	1672.55	
13	37	12	673		
14	38	12	361	1681.51	-1.24%
15	39	12	153	1677.02	
16	40	12	1047		
17	41	12	235		
18	42	12			

*lengths from "Searles Valley Effluent Line and Manhole Priorities"

**inverts from "Survey Request Map 9-18-2017" in Attachment 4

Alternative 2 - Intermediate Manholes

Number of manholes	Manhole	Main Size (inches)	Distance to next in LF (existing)	Distance to next in LF (proposed)
1	25	12	983	491.5
2	25.1			491.5
3	26	12	1000	500
4	26.1			500
5	27	12	997	498.5
6	27.1			498.5
7	28	12	609	304.5
8	28.1			304.5
9	29	12	12	12
10	30	12	565	282.5
11	30.1			282.5
12	31	12	577	288.5
13	31.1			288.5
14	32	12	565	282.5
15	32.1			282.5
16	33	12	816	408
17	33.1			408
18	34	12	816	408
19	34.1			408
20	35	12	797	398.5
21	35.1			398.5
22	36	12	1111	555.5
23	36.1			555.5
24	37	12	673	336.5
25	37.1			336.5
26	38	12	361	361
27	39	12	153	153
28	40	12	1047	523.5
29	40.1			523.5
30	41	12	235	235
31	42	12		

*lengths from "Searles Valley Effluent Line and Manhole Priorities"

**inverts from "Survey Request Map 9-18-2017" in Attachment 4

Alternative 3 - Install Manholes Approximately every 300 LF to 400 LF

Number of Manholes	Manhole	Main Size (inches)	Distance to next in LF (existing)	Distance to next in LF (proposed)
1	25	12	983	328
2	25.1			328
3	25.2			328
4	26	12	1000	333
5	26.1			333
6	26.2			333
7	27	12	997	332
8	27.1			332
9	27.2			332
10	28	12	609	305
11	28.1			305
12	29	12	12	12
13	30	12	565	283
14	30.1			283
15	31	12	577	289
16	31.1			289
17	32	12	565	283
18	32.1			283
19	33	12	816	408
20	33.1			408
21	34	12	816	408
22	34.1			408
23	35	12	797	399
24	35.1			399
25	36	12	1111	370
26	36.1			370
27	36.2			370
28	37	12	673	337
29	37.1			337
30	38	12	361	361
31	39	12	153	153
32	40	12	1047	349
33	40.1			349
34	40.2			349
35	41	12	235	235
36	42	12		

*lengths from "Searles Valley Effluent Line and Manhole Priorities"

**inverts from "Survey Request Map 9-18-2017" in Attachment 4

Alternative 4 - Install Manholes no more than 300 LF apart

Number of Manholes	Manhole	Main Size (inches)	Distance to next in LF (existing)	Distance to next in LF (proposed)
1	25	12	983	246
2	25.1			246
3	25.2			246
4	25.3			246
5	26	12	1000	250
6	26.1			250
7	26.2			250
8	26.3			250
9	27	12	997	249
10	27.1			249
11	27.2			249
12	27.3			249
13	28	12	609	305
14	28.1			305
15	29	12	12	12
16	30	12	565	283
17	30.1			283
18	31	12	577	289
19	31.1			289
20	32	12	565	283
21	32.1			283
22	33	12	816	272
23	33.1			272
24	33.2			272
25	34	12	816	272
26	34.1			272
27	34.2			272
28	35	12	797	266
29	35.1			266
30	35.2			266
31	36	12	1111	278
32	36.1			278
33	36.2			278
34	36.3			278
35	37	12	673	224
36	37.1			224
37	37.2			224
38	38	12	361	181
39	38.1			181
40	39	12	153	153
41	40	12	1047	262
42	40.1			262
43	40.2			262
44	40.3			262
45	41	12	235	235
46	42	12		

*lengths from "Searles Valley Effluent Line and Manhole Priorities"

**inverts from "Survey Request Map 9-18-2017" in Attachment 4

ATTACHMENT 5 – FLOW DATA

SEARLES DOMESTIC WATER COMPANY 2022 DATA

1985 DATA SEWER STUDY

NOT FOR BID

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SEARLES DOMESTIC WATER COMPANY
METERED CUBIC FEET CONVERTED TO GALLONS

2022

MONTH	20, 26 & 27 PIONEER POINT CU. FT.	PIONEER POINT GALLONS	40 SCH 3 SCHOOL CU. FT.	40, 43, & 44 LESS SCHOOL TRONA CU. FT.	TRONA METERED GALLONS	60, 61 62, & 64 ARGUS CU. FT.	ARGUS METERED GALLONS	80 & 89 CO. YD. SOUTH TRONA CU. FT.	88 WESTEND CU. FT.	SOUTH TRONA WESTEND METERED GALLONS	TOTAL CU. FT.	TOTAL METERED GALLONS
JANUARY	192,200	1,437,656	1,600	124,800	945,472	45,300	338,844	1,800	10,400	91,256	376,100	2,813,228
FEBRUARY	217,000	1,623,160	13,000	145,200	1,183,336	45,600	341,088	900	10,500	85,272	432,200	3,232,856
MARCH	214,900	1,607,452	8,500	146,600	1,160,148	58,700	439,076	900	9,200	75,548	438,800	3,282,224
APRIL	253,500	1,896,180	9,300	146,000	1,161,644	53,600	400,928	600	10,800	85,272	473,800	3,544,024
MAY	314,000	2,348,720	16,000	187,600	1,522,928	61,200	457,776	800	15,800	124,168	595,400	4,453,592
JUNE	398,400	2,980,032	30,900	221,300	1,886,456	79,500	594,660	600	20,700	159,324	751,400	5,620,472
JULY	0	0	0	0	0	0	0	0	0	0	0	0
AUGUST	0	0	0	0	0	0	0	0	0	0	0	0
SEPTEMBER	0	0	0	0	0	0	0	0	0	0	0	0
OCTOBER	0	0	0	0	0	0	0	0	0	0	0	0
NOVEMBER	0	0	0	0	0	0	0	0	0	0	0	0
DECEMBER	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	1,590,000	11,893,200	79,300	971,500	7,859,984	343,900	2,572,372	5,600	77,400	620,840	3,067,700	22,946,396

SUMMARY REPORT
PIONEER POINT - TRONA SEWER SYSTEM STUDY

JANUARY 1985

WILSON F. SO & ASSOCIATES INCORPORATED, CONSULTING ENGINEERS
16018 Tuscola Road, Apple Valley, CA 92307

WILSON F. SO & ASSOCIATES, INC., CONSULTING ENGINEERS

P. O. Box 368/16018 Tuscola Road, Suite 7, Apple Valley, CA 92307 (619) 242-2365

January 10, 1985

County of San Bernardino
Special Districts Department
P.O. Box SVL 7036
Victorville, CA 92392

Attention: Mr. Donald Songer

Reference: Pioneer Point and Trona Sewer System Evaluation

Dear Don:

In accordance with our agreement with the County of San Bernardino, we have completed the subject sewer system field survey, computer analysis and system evaluation. Our findings are briefly summarized in the enclosed study report. Following your review, we would be happy to meet with you to discuss and incorporate your comments into the report.

Based on our recommended approach to correct the system deficiencies described in the report, the estimated funds required to correct the several problem areas are as follows:

- Trona - \$34,159
- Pioneer Point - \$46,404

We appreciate the opportunity to assist the County of San Bernardino in this study and the assistance and cooperation extended by you and your staff.

Very truly yours,


Wilson F. So, P.E.
Project Engineer

PROJECT STAFF

Wilson F. So
Eric Leung
William So, Jr.
Vernon Johns
Diana Tobias

Project Engineer
Assistant Project Engineer
Computer Evaluation
Graphics
Report Reproduction

PIONEER POINT - TRONA SEWER SYSTEM STUDY

A. AUTHORIZATION AND SCOPE

This report is to summarize findings of an evaluation study conducted for the Trona and the Pioneer Point Collector Sewer Systems. The Scope of Work outlined in the Agreement between County of San Bernardino and Wilson F. So & Associates includes the following tasks:

- Furnish horizontal and vertical control surveys for checking of as-builts.
- Input to computer with data from field surveys to verify capacity and to identify lines required for future development (with coordination and input from County staff).
- Update sewer piping/manhole and elevation information and record this information on new index maps. Provide cost estimates for replacement of existing facilities and new facilities.

B. STUDY AREA AND LAND-USE

The study area boundary and land use for Pioneer Point and Trona are shown on Figure 1. Land use consists of R-1 (single family residence), R-2 (two family residence), R-3 (multiple family residence) and C (commercial). Table-1 summarizes the criteria (as adopted by County of San Bernardino) used to estimate the sewage flow.

TABLE -1
EVALUATION CRITERIA

LAND USE

R-1	= 1 D.U./LOT	2.35 PERSONS/D.U.	100 GPD/PERSON
R-2	= 2 D.U./LOT	2.35 PERSONS/D.U.	100 GPD/PERSON
R-3	= 3 D.U./LOT	2.35 PERSONS/D.U.	100 GPD/PERSON
COMMERCIAL			1500 GPD/ACRE
SCHOOL	802 STUDENTS		25 GPD/PERSON

Average sewage flow into a given collector sewer line is calculated based on number of lots, land use, and the flow coefficient. A peaking factor of 3 is used because all flows are relatively small. Tables 2 and 3 summarize the total projected sewage flows.

TABLE-2
PIONEER POINT WASTEWATER FLOWS

LAND USE	AREA (Ac)	NUMBER OF LOTS		AVG. FLOW RATE(MGD)		PEAK FLOW RATE (MGD)		
	CSA	POINT OF ROCKS INCLUDED	CSA	POINT OF ROCKS INCLUDED	CSA	POINT OF ROCKS INCLUDED	CSA	POINT OF ROCKS INCLUDED
R-1	151.5	241	357	676	0.083895	0.15886		
R-2	.5	24	2	87	.00094	.04089		
R-3	0	0	0	0	0	0		
COMMERCIAL	9	9	23	23	.0135	.0135		
	161	274	382	786	0.098335	0.21325	0.314672	0.63975

TABLE-3
TRONA WASTEWATER FLOWS

LAND USE	AREA (Ac)	NO OF LOTS	AVG FLOW (MGD)	PEAK FLOW (MGD)
R-1	90	265	0.062275	
R-2	22	43	0.02021	
R-3	9	3	0.002115	
COMMERCIAL	37	33	0.0555	
SCHOOL	37	2	0.02005	
TOTAL	195	346	0.16015	0.496465

C. FIELD SURVEYS

Purpose of the field survey is a general verification of sewer pipe distances between manholes, depths from top of manhole cover to pipe invert, and conditions of the sewer system. Field measurement work was done by our in-house surveying crew. Table-4 is a listing of manholes that were covered by asphalt pavement and could not be field verified. Consequently, the pipe lengths and inverts could not be checked and information for subsequent computer evaluation were taken from as-built drawings. The effluent line from Pioneer Point to Trona's leach field was not included in this survey.

TABLE-4
MANHOLES THAT CAN NOT BE FIELD VERIFIED

PIONEER POINT M.H. NO.	TRONA M.H. NO
7	2
8	3
22	4
29	5
30	6
31	9
33	10
36	11
50	12-A
118	13
202	17
205	18
	19
	20
	21
	D-2
	F-6A
	F-7
	O-4

As the County staff uncovers manholes listed in Table-4, information can be checked and furnished to Wilson F. So & Associates to update the Sewer System Index Map.

D. SEWER SYSTEM CAPACITY EVALUATION

Field survey data, together with information abstracted from as-built drawings, were analyzed using in-house IBM computer and program. Data and output results are included in Appendix A (Pioneer Point) and Appendix B (Trona). Table-5 and Table-6 summarizes the deficient areas both for Pioneer Point and Trona.

TABLE-5
PIONEER POINT - LINE SECTIONS FOUND TO BE BELOW MINIMUM SLOPE

ZONE 1	UPSTREAM M.H. NO.	DOWNSTREAM M.H. NO.	DIAMETER (Inch)	SLOPE ^(a) (%)	FULL & ½ FULL VELOCITY (fps)
LOCATION (1)	11	10	8	0.25	1.74
(2)	9	8	8	-0.28 ^(b)	?
(3)	5	4	8	0.32	1.97
(4)	4	3	8	0.39	2.16
(5)	18	17	8	0.35	2.06
<u>ZONE 2</u>					
LOCATION (6)	100	50	8	0.16	1.38
(7)	Future Cleanouts	105	4	--	Replace w/6-inch or 8-inch

- (a) Minimum slope per County standard for 8-inch diameter pipe is 0.4%
(b) Negative slope means reverse grade, needs to be field verified.

TABLE-6
TRONA - LINE SECTIONS FOUND TO BE BELOW MINIMUM GRADE

ZONE 1	UPSTREAM M.H. NO.	DOWNSREAM M.H. NO.	DIAMETER (INCH)	SLOPE ^(a) (%)	FULL & ½ FULL VELOCITY (fps)
LOCATION (1)	L-4	L-3	8	0.37	2.1
(2)	M-4	M-5	8	0.22	1.62
(3)	13	12A	10	0.01	0.39
(4)	12A	12	10	0.08	1.15
(5)	12	11	10	0.27	2.08
(6)	10	9	10	0.28	2.12
(8)	4	Wildrose (see note)			
ZONE 2					
Location (7)	0-2	0-3	8	0.29	1.87

(a) Minimum slope per County standard for 8-inch diameter pipe is 0.4% and for 10-inch diameter pipe is 0.29%

E. RECOMMENDATIONS TO CORRECT SEWER SYSTEM DEFICIENCIES AND COSTS

Based on review of minimum flow velocities and adjoining pipe sections, Engineer's recommendations are briefly summarized below:

Pioneer Point

(1) Location 1 - Leave condition as it is or reconstruct a total of 587 lineal feet of existing 8-inch diameter sewer pipe between manholes 12 to 11 and 11 to 10, plus 110 feet of pipe easterly of manhole 11 on Hemlock Street at a cost of approximately \$16,659. Unit pipe construction costs (mid 1985 index) are included under Appendix C.

(2) Location 2 - Reconstruct existing 655 feet of 8-inch sewer between manholes 9 and 7 at a cost of approximately \$20,089. Several alternatives were analyzed as follows:

- 2(A) Replace sewer pipe between MH#9 and MH#7 with 8" diameter PVC sewer pipe of 0.36%* slope (total length = 655 ft).

Ø = 8" L = 655 ft	\$ 18,589.00
1 MH @ \$1500/EA	\$ 1,500.00
	<u>\$ 20,089.00</u>

* 0.36% slope is less than 0.4% slope (min. slope), however, it will eliminate possible surcharge at upstream manholes.

- 2(B) Replace sewer pipe between MH#9 and MH#6 with 8" diameter PVC sewer pipe at 0.47% slope (total length = 990 ft).

Ø = 8" L = 990 ft	\$ 28,096.00
2 MH @ \$1500/EA	\$ 3,000.00
	<u>\$ 31,096.00</u>

- 2(C) Replace sewer pipe between MH#9 and MH#8 (L=319') with 10" diameter sewer pipe at 0.29% slope and sewer pipe between MH#8 and MH#7 (L=336 ft) with 8" diameter sewer pipe at 0.41% slope.

Ø = 8" L = 336 ft	\$ 9,536.00
Ø = 10" L = 319 ft	\$ 9,911.00
1 MH @ \$1500/EA	\$ 1,500.00
	<u>\$20,947.00</u>

- (3) Location 3 - Leave condition as it is.
- (4) Location 4 - Leave condition as it is.
- (5) Location 5 - Leave condition as it is.
- (6) Location 6 - Replace existing 238 lineal feet of 8-inch diameter sewer with 15-inch diameter sewer pipe at 0.16% slope at a cost of approximately \$9,656.
- (7) Location 7 - Cost to be determined upon future field verification when manholes and/or sewer pipes are exposed during cleaning.

Trona

- (1) Location 1 - Leave condition as it is.
- (2) Location 2 - Leave condition as it is or reconstruct 530 lineal feet of 8-inch diameter sewer pipe between MH M-7 and M-5 including replacement of an old deteriorated manhole at a cost of approximately \$16,541.
- (3) Locations 3 and 4 - Reconstruct 711 lineal feet of 10-inch diameter pipe between manholes 14 and 12 with 10-inch diameter pipe and eliminate one manhole at a cost of approximately \$ 17,618. Several alternatives were examined as follows:
- 3(A) Leave surcharge condition as it is because:
- (1) Computer analysis shows that the surcharge is tolerable.
- (2) Computer simulation was done based on 100% land use saturation. It is unlikely that there will be a significant amount of surcharge at upstream manholes in the future.
- (3) Only 108 LF of sewer pipe has 0.01% slope (flat).

- 3(B) Replace sewer pipe between MH#14 and MH#12 (L=711 ft) with 10" diameter sewer pipe at 0.21%* slope.

Ø = 10" L= 711 ft	\$ 16,118.00
1 MH @ \$1500/EA	\$ 1,500.00
	<u>17,618.00</u>

* Pipe slope of 0.21% is less than 0.29% (minimum slope), however, it will eliminate the surcharge problem.

- 3(C) Replace sewer pipe between MH#14 and MH#12 (L=711 ft) with 12" diameter sewer pipe at 0.21% slope (minimum slope) at 0.22%.

Ø = 12" L = 711 ft	\$ 17,659.00
1 MH @ 1500/EA	\$ 1,500.00
	<u>\$ 19,159.00</u>

- (4) Location 5 - Leave condition as it is.
- (5) Location 6 - Leave condition as it is.
- (6) Location 7 - Leave condition as it is.
- (7) Location 8 - Replace 4-inch line between Lupine and Wildrose with new 6" plus manhole and cleanout.
- (8) Location 9 - (Not shown on Table 6) Replace and relocate MH#M-6.

SIXTH STANDARD LINE SOUTH MOUNT DIABLO MERIDIAN

IMYO COUNTY

SAN BERNARDINO COUNTY

PIONEER POINT

APPROXIMATE DISTRICT BOUNDARY

PIONEER POINT

APPROXIMATE DISTRICT

STREET NAMES: FIRST, SECOND, THIRD, FOURTH, FIFTH, SIXTH, SEVENTH, EIGHTH, NINTH, TENTH, ELEVENTH, TWELFTH, THIRTEENTH, FOURTEENTH, FIFTEENTH, SIXTEENTH, SEVENTEENTH, EIGHTEENTH, NINETEENTH, TWENTIETH, TWENTY-FIRST, TWENTY-SECOND, TWENTY-THIRD, TWENTY-FOURTH, TWENTY-FIFTH, TWENTY-SIXTH, TWENTY-SEVENTH, TWENTY-EIGHTH, TWENTY-NINTH, THIRTIETH, THIRTY-FIRST, THIRTY-SECOND, THIRTY-THIRD, THIRTY-FOURTH, THIRTY-FIFTH, THIRTY-SIXTH, THIRTY-SEVENTH, THIRTY-EIGHTH, THIRTY-NINTH, FORTIETH.

Other labels: LAGUNA, PIONEER POINT, APPROXIMATE DISTRICT, CANYON, BERTON, ALDER, CEDAR, DOBWOOD, ELN, FIFTH, SIXTH, SEVENTH, EIGHTH, NINTH, TENTH, ELEVENTH, TWELFTH, THIRTEENTH, FOURTEENTH, FIFTEENTH, SIXTEENTH, SEVENTEENTH, EIGHTEENTH, NINETEENTH, TWENTIETH, TWENTY-FIRST, TWENTY-SECOND, TWENTY-THIRD, TWENTY-FOURTH, TWENTY-FIFTH, TWENTY-SIXTH, TWENTY-SEVENTH, TWENTY-EIGHTH, TWENTY-NINTH, THIRTIETH, THIRTY-FIRST, THIRTY-SECOND, THIRTY-THIRD, THIRTY-FOURTH, THIRTY-FIFTH, THIRTY-SIXTH, THIRTY-SEVENTH, THIRTY-EIGHTH, THIRTY-NINTH, FORTIETH.



SCALE: 1" = 1000'

LEGEND

- | | | |
|-----|--|---------------------------|
| R-1 | | SINGLE FAMILY RESIDENCE |
| R-2 | | TWO-FAMILY RESIDENCE |
| R-3 | | MULTIPLE FAMILY RESIDENCE |
| C | | COMMERCIAL AREA |

APPROXIMATE DISTRICT BOUNDARY

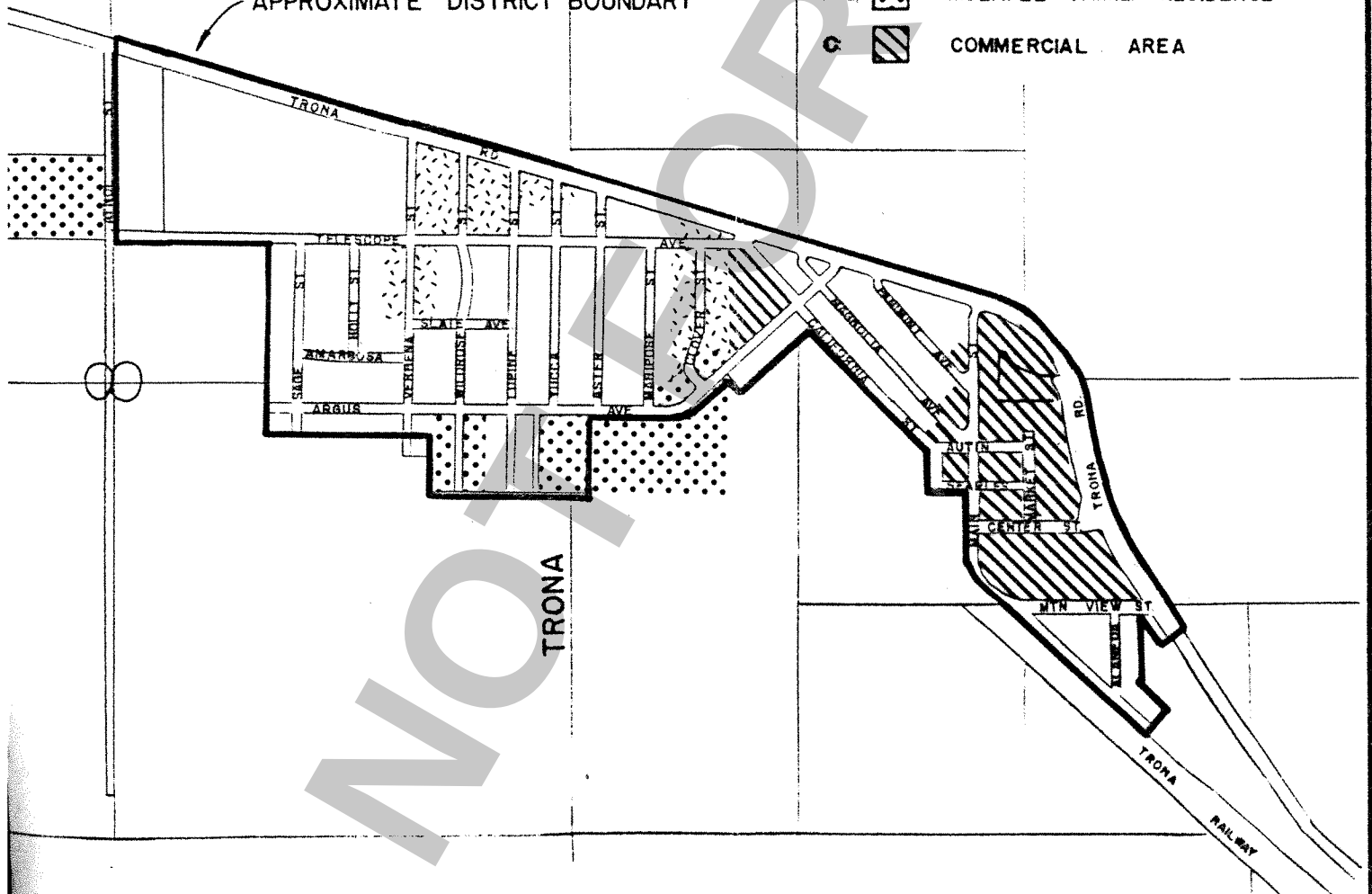


FIGURE 1
LAND USE-PIONEER POINT & TRONA
SAN BERNARDINO COUNTY
SPECIAL DISTRICTS DEPARTMENT

NOT FOR BID

SANITARY COLLECTION SYSTEM ANALYSIS AND DESIGN

-- INPUT DATA --

PIONEER POINT SEWER ANALYSIS - ZONE 1

DATE: 09-26-1984

TIME: 12:00:25

LIMITING CONSTANTS

NO. OF MANHOLES = 50

NO. OF LAST MH. = 15

FLOW DESIGN CONSTANTS

SYSTEM PEAK FACTOR = 3

MINOR HEAD LOSS COEFFICIENT = 0

N VALUE VARIABLE WITH FLOW DEPTH

MANNING N FACTOR = .013

DESIGN CRITERIA

ANALYSIS ONLY OF SYSTEM

NOTE: INTERMEDIATE GROUND ELEVATIONS NOT INCLUDED

MANHOLE LINK DATA

LINK NO.	U.M. TITLE	D.M. NO.	PIPE DIA. in	LINK LENGTH ft	MANNING N	GROUND ELEV. ft	U.M. DEPTH ft	D.M. DEPTH ft	COST CODE	DESIGN CRITERIA	LIFT STATION
1	M13	2	8.0	368.00	0.0130	1681.96	4.24	4.15	1100.0	4	N
2	M12	3	8.0	271.00	0.0130	1673.73	4.15	4.32	1100.0	4	N
3	M11	4	8.0	206.00	0.0130	1667.76	6.22	6.70	1100.0	4	N
4	M10	5	8.0	301.00	0.0130	1667.72	6.70	6.50	1100.0	4	N
5	M9	6	8.0	319.00	0.0130	1666.29	6.50	5.96	1100.0	4	N
6	M8	7	8.0	336.00	0.0130	1666.64	5.96	6.00	1100.0	4	N
7	M7	8	8.0	335.00	0.0130	1663.44	6.00	6.15	1100.0	4	N
8	M6	9	8.0	346.00	0.0130	1661.33	6.15	5.45	1100.0	4	N
9	M5	10	8.0	345.00	0.0130	1659.07	5.45	5.50	1100.0	4	N
10	M4	11	8.0	344.00	0.0130	1658.00	5.50	5.60	1100.0	4	N
11	M3	12	8.0	316.00	0.0130	1656.76	5.60	6.75	1100.0	4	N
12	M2	13	8.0	254.00	0.0130	1656.28	6.75	6.90	1100.0	4	N
13	M1-B	14	8.0	324.00	0.0130	1653.09	6.90	5.67	1100.0	4	N
14	M1	15	8.0	308.00	0.0130	1650.37	5.67	4.45	1100.0	4	N
15	M49	0	0.0	0.00	0.0130	1646.30	4.45	0.00	1100.0	4	N
16	M202	17	8.0	287.00	0.0130	1713.82	8.04	8.15	1100.0	4	N
17	M201	18	8.0	334.00	0.0130	1703.77	8.15	8.20	1100.0	4	N
18	M200	19	8.0	270.00	0.0130	1693.49	8.20	6.16	1100.0	4	N
19	M25	20	8.0	502.00	0.0130	1686.13	6.16	4.72	1100.0	4	N
20	M23	21	8.0	336.00	0.0130	1673.46	4.72	5.28	1100.0	4	N
21	M22	22	8.0	335.00	0.0130	1671.98	5.30	4.50	1100.0	4	N
22	M21	23	8.0	349.00	0.0130	1668.79	4.50	5.43	1100.0	4	N
23	M20	24	8.0	345.00	0.0130	1667.60	5.43	5.52	1100.0	4	N
24	M19	25	8.0	346.00	0.0130	1665.31	5.52	5.45	1100.0	4	N
25	M18	26	8.0	345.00	0.0130	1663.22	5.45	5.58	1100.0	4	N
26	M213	27	8.0	295.00	0.0130	1682.71	4.15	3.90	1100.0	4	N
27	M212	28	8.0	100.00	0.0130	1679.99	3.90	4.88	1100.0	4	N
28	M33	29	8.0	204.00	0.0130	1680.00	4.84	5.90	1100.0	4	N
29	M32	30	8.0	352.00	0.0130	1678.59	5.90	6.24	1100.0	4	N
30	M30	31	8.0	242.00	0.0130	1674.34	6.24	6.17	1100.0	4	N
31	M29	32	8.0	222.00	0.0130	1671.63	6.37	6.80	1100.0	4	N
32	M28	33	8.0	137.00	0.0130	1669.09	6.80	7.70	1100.0	4	N
33	M27	25	8.0	195.00	0.0130	1666.38	7.70	5.45	1100.0	4	N
34	M209	37	8.0	184.00	0.0130	1694.42	8.05	7.95	1100.0	4	N
35	M211	36	8.0	323.00	0.0130	1700.34	9.45	8.10	1100.0	4	N

36	M210	37	8.0	114.00	0.0130	1692.91	8.10	7.95	1100.0	4	N
37	M208	40	8.0	259.00	0.0130	1690.20	7.95	7.05	1100.0	4	N
38	M205	39	8.0	275.00	0.0130	1695.29	7.99	8.10	1100.0	4	N
39	M206	40	8.0	269.00	0.0130	1688.96	8.10	7.05	1100.0	4	N
40	M207	27	8.0	242.00	0.0130	1684.13	7.05	3.90	1100.0	4	N
41	M122	42	6.0	340.00	0.0130	1694.80	3.80	3.55	1100.0	4	N
42	M121	43	6.0	287.00	0.0130	1691.20	3.55	4.30	1100.0	4	N
43	M38	44	8.0	274.00	0.0130	1685.81	4.30	5.25	1100.0	4	N
44	M39	29	8.0	275.00	0.0130	1682.27	5.25	5.90	1100.0	4	N
45	M31	30	8.0	111.00	0.0130	1675.23	5.15	6.00	1100.0	4	N
46	M36	47	8.0	301.00	0.0130	1676.95	4.40	5.70	1100.0	4	N
47	M35	32	8.0	174.00	0.0130	1672.63	5.70	6.80	1100.0	4	N
48	M26	33	8.0	375.00	0.0130	1665.72	2.50	7.70	1100.0	4	N
49	M17	50	8.0	171.00	0.0130	1662.13	5.58	6.28	1100.0	4	N
50	M16	12	8.0	403.00	0.0130	1661.25	6.28	6.75	1100.0	4	N

NODE SOLUTION ORDER

SOLUTION ORDER	U.M. NO.	D.M. NO.	TRIBUTARY NODES		
			1	2	3
1	1	2	0	0	0
2	2	3	1	0	0
3	3	4	2	0	0
4	4	5	3	0	0
5	5	6	4	0	0
6	6	7	5	0	0
7	7	8	6	0	0
8	8	9	7	0	0
9	9	10	8	0	0
10	10	11	9	0	0
11	11	12	10	0	0
12	16	17	0	0	0
13	17	18	16	0	0
14	18	19	17	0	0
15	19	20	18	0	0
16	20	21	19	0	0
17	21	22	20	0	0
18	22	23	21	0	0
19	23	24	22	0	0
20	24	25	23	0	0
21	26	27	0	0	0
22	34	37	0	0	0
23	35	36	0	0	0
24	36	37	35	0	0
25	37	40	34	36	0
26	38	39	0	0	0
27	39	40	38	0	0
28	40	27	37	39	0
29	27	28	26	40	0
30	28	29	27	0	0
31	41	42	0	0	0
32	42	43	41	0	0
33	43	44	42	0	0
34	44	29	43	0	0
35	29	30	28	44	0
36	45	30	0	0	0
37	30	31	29	45	0
38	31	32	30	0	0
39	46	47	0	0	0
40	47	32	46	0	0
41	32	33	31	47	0

42	48	33	0	0	0
43	33	25	32	48	0
44	25	49	24	33	0
45	49	50	25	0	0
46	50	12	49	0	0
47	12	13	11	50	0
48	13	14	12	0	0
49	14	15	13	0	0

FLOW INPUT DATA

M.H. NO.	INPUT FLOW (cfs)	PEAK FACTOR
1	0.002	3.00
2	0.002	3.00
3	0.002	3.00
4	0.002	3.00
5	0.002	3.00
6	0.002	3.00
7	0.002	3.00
8	0.002	3.00
9	0.002	3.00
10	0.002	3.00
11	0.002	3.00
12	0.002	3.00
13	0.002	3.00
14	0.002	3.00
15	0.002	3.00
16	0.002	3.00
17	0.002	3.00
18	0.002	3.00
19	0.002	3.00
20	0.002	3.00
21	0.002	3.00
22	0.002	3.00
23	0.002	3.00
24	0.002	3.00
25	0.002	3.00
26	0.002	3.00
27	0.002	3.00
28	0.002	3.00
29	0.002	3.00
30	0.002	3.00
31	0.002	3.00
32	0.002	3.00
33	0.002	3.00
34	0.002	3.00
35	0.002	3.00
36	0.002	3.00
37	0.002	3.00
38	0.002	3.00
39	0.002	3.00
40	0.002	3.00
41	0.002	3.00
42	0.002	3.00
43	0.002	3.00
44	0.002	3.00
45	0.002	3.00
46	0.002	3.00
47	0.002	3.00
48	0.002	3.00
49	0.002	3.00

50

0.002

3.00

INFORMATION TO BE ENTERED INTO ANALYSIS

U.M. TITLE	D.M. TITLE	U.M. NO.	D.M. NO.	FLOW INTO MH.	ACCUM. FLOW	PEAK FLOW	U.M. DEPTH	D.M. DEPTH
				cfs	cfs	cfs	ft	ft
M13	M12	1	2	0.002	0.002	0.006	4.24	4.15
M12	M11	2	3	0.002	0.004	0.013	4.15	4.32
M11	M10	3	4	0.002	0.006	0.019	6.22	6.70
M10	M9	4	5	0.002	0.009	0.026	6.70	6.50
M9	M8	5	6	0.002	0.011	0.032	6.50	5.96
M8	M7	6	7	0.002	0.013	0.039	5.96	6.00
M7	M6	7	8	0.002	0.015	0.045	6.00	6.15
M6	M5	8	9	0.002	0.017	0.051	6.15	5.45
M5	M4	9	10	0.002	0.019	0.058	5.45	5.50
M4	M3	10	11	0.002	0.021	0.064	5.50	5.60
M3	M2	11	12	0.002	0.024	0.071	5.60	6.75
M2	M1-8	12	13	0.002	0.101	0.302	6.75	6.90
M1-8	M1	13	14	0.002	0.103	0.309	6.90	5.67
M1	M49	14	15	0.002	0.105	0.315	5.67	4.45
M202	M201	16	17	0.002	0.002	0.006	8.04	8.15
M201	M200	17	18	0.002	0.004	0.013	8.15	8.20
M200	M25	18	19	0.002	0.006	0.019	8.20	6.16
M25	M23	19	20	0.002	0.009	0.026	6.16	4.72
M23	M22	20	21	0.002	0.011	0.032	4.72	5.28
M22	M21	21	22	0.002	0.013	0.039	5.30	4.50
M21	M20	22	23	0.002	0.015	0.045	4.50	5.43
M20	M19	23	24	0.002	0.017	0.051	5.43	5.52
M19	M18	24	25	0.002	0.019	0.058	5.52	5.45
M18	M17	25	49	0.002	0.071	0.212	5.45	5.58
M213	M212	26	27	0.002	0.002	0.006	4.15	3.90
M212	M33	27	28	0.002	0.019	0.058	3.90	4.88
M33	M32	28	29	0.002	0.021	0.064	4.84	5.90
M32	M30	29	30	0.002	0.032	0.096	5.90	6.24
M30	M29	30	31	0.002	0.036	0.109	6.24	6.17
M29	M28	31	32	0.002	0.039	0.116	6.37	6.80
M28	M27	32	33	0.002	0.045	0.135	6.80	7.70
M27	M18	33	25	0.002	0.049	0.148	7.70	5.45
M209	M208	34	37	0.002	0.002	0.006	8.05	7.95
M211	M210	35	36	0.002	0.002	0.006	9.45	8.10
M210	M208	36	37	0.002	0.004	0.013	8.10	7.95
M208	M207	37	40	0.002	0.009	0.026	7.95	7.05
M205	M206	38	39	0.002	0.002	0.006	7.99	8.10
M206	M207	39	40	0.002	0.004	0.013	8.10	7.05
M207	M212	40	27	0.002	0.015	0.045	7.05	3.90
M122	M121	41	42	0.002	0.002	0.006	3.80	3.55
M121	M38	42	43	0.002	0.004	0.013	3.55	4.30
M38	M39	43	44	0.002	0.006	0.019	4.30	5.25
M39	M32	44	29	0.002	0.009	0.026	5.25	5.90
M31	M30	45	30	0.002	0.002	0.006	5.15	6.00
M36	M35	46	47	0.002	0.002	0.006	4.40	5.70
M35	M28	47	32	0.002	0.004	0.013	5.70	6.80
M26	M27	48	33	0.002	0.002	0.006	2.50	7.70
M17	M16	49	50	0.002	0.073	0.219	5.58	6.28
M16	M2	50	12	0.002	0.075	0.225	6.28	6.75

PIPE SET DATA

COST DATA

EXCAVATION COST DATA
ITEM NO. EXCAVATION LIMITS UNIT PRICE
ft. ft /lin ft

BACKFILL COST MULTIPLIERS

BEDDING COST DATA
CLASS C BEDDING INCLUDED IN EXCAVATION COST
CLASS B BEDDING AT AN ADDITIONAL COST OF 0.00 PER LINEAR FOOT

PIPE COST DATA
ITEM NO. PIPE SIZE UNIT PRICE
in /lin ft

MANHOLE COST DATA
STANDARD MANHOLE: 0.00 TO 0.00 ft DEEP WITH A MAXIMUM DROP OF
0.00 ft AT A UNIT PRICE OF 0.00 EACH.
ADDITIONAL MANHOLE DEPTH AT A UNIT PRICE OF
0.00 PER LINEAR FOOT.
DROP OVER 0.00 ft THRU M.H. AT A UNIT PRICE OF
0.00 PER LINEAR FOOT.

STREET REPAIR COST DATA

SANITARY COLLECTION SYSTEM ANALYSIS AND DESIGN

PIONEER POINT SEWER ANALYSIS - ZONE 1

DATE: 09-26-1984

ITERATION # 1

LINK DATA				ELEVATION DATA				FLOW ANALYSIS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
PIPE		LINK	PIPE	UPSTREAM MANHOLE		DOWNSTR. MH.		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE		PIPE	

--- SOLUTION ---

PIONEER POINT SEWER ANALYSIS - ZONE 1

TIME: 12:10:11

PAGE: 2

DATE: 09-26-1984

ITERATION # 1

--		LINK DATA			ELEVATION DATA				FLOW ANALYSIS									
--		PIPE	LINK	LINK	--	UPSTREAM	MANHOLE	--	DOWNSTR.	MH.	---		FULL	PIPE---	PEAK	FLOW	--	INPUT
--		DIA.	LENGTH	SLOPE	--	ELEV.	DEPTH--	ft	ELEV.	DEPTH	---		CAPACITY	---FLOW	VEL.--	DEPTH--	FLOW	CONDITION
TITLE NO.		in	ft	%	ft	ft	ft	ft	ft	ft	cfs	cfs	cfs	fpm	fpm	in	cfs	fps
M39	44 M32	29	0	+1.57	1682.27	1677.02	5.25	1672.69	5.90		1.52	4.34	0.03	1.38	0.77	0.01	1.05	0.46
M31	45 M30	30	0	+1.57	1675.23	1670.08	5.15	1668.34	6.00		1.51	4.33	0.01	0.87	0.37	0.00	0.29	0.12
M36	46 M35	47	0	+1.87	1676.95	1672.55	4.40	1666.93	5.70		1.65	4.73	0.01	0.87	0.40	0.00	0.29	0.11
M35	47 M28	32	0	+2.67	1672.63	1666.93	5.70	1662.29	6.80		1.97	5.65	0.01	1.41	0.49	0.00	0.58	0.19
M26	48 M27	33	0	+1.21	1665.72	1663.22	2.50	1658.68	7.70		1.33	3.81	0.01	0.87	0.42	0.00	0.29	0.14
M17	49 M16	50	0	+0.92	1662.13	1656.55	5.58	1654.97	6.28		1.16	3.33	0.22	2.18	2.63	0.07	1.57	1.50
M14	50 M2	12	0	+1.35	1661.25	1654.97	6.28	1649.51	6.75		1.40	4.02	0.23	2.51	2.42	0.08	1.82	1.39

SANITARY COLLECTION SYSTEM ANALYSIS AND DESIGN

-- INPUT DATA --

PIONEER POINT SEWER ANALYSIS - ZONE 2

DATE: 09-28-1984

TIME: 13:46:36

LIMITING CONSTANTS

NO. OF MANHOLES = 22

NO. OF LAST MH. = 22

FLOW DESIGN CONSTANTS

SYSTEM PEAK FACTOR = 3

MINOR HEAD LOSS COEFFICIENT = 0

N-VALUE VARIABLE WITH FLOW DEPTH

MANNING N FACTOR = .013

DESIGN CRITERIA

ANALYSIS ONLY OF SYSTEM

NOTE: INTERMEDIATE GROUND ELEVATIONS NOT INCLUDED

MANHOLE LINK DATA

LINK NO.	U.M. TITLE	D.M. NO.	PIPE DIA. in	LINK LENGTH ft	MANNING N	GROUND ELEV. ft	U.M. DEPTH ft	D.M. DEPTH ft	COST CODE	DESIGN CRITERIA	LIFT STATION
1	M115	2	6.0	340.00	0.0130	1655.43	2.90	3.82	1100.0	4	N
2	M111	3	6.0	300.00	0.0130	1653.92	3.82	4.48	1100.0	4	N
3	M108	4	6.0	156.00	0.0130	1651.61	4.48	5.15	1100.0	4	N
4	M106	14	6.0	125.00	0.0130	1650.87	5.15	6.00	1100.0	4	N
5	M214	6	6.0	12.00	0.0130	1668.16	5.55	6.00	1100.0	4	N
6	M114	7	6.0	165.00	0.0130	1668.02	6.00	5.15	1100.0	4	N
7	M113	8	6.0	263.00	0.0130	1664.23	5.15	4.30	1100.0	4	N
8	M112	2	6.0	326.00	0.0130	1659.37	4.30	3.82	1100.0	4	N
9	M119	10	8.0	227.00	0.0130	1673.10	3.98	4.90	1100.0	4	N
10	M118	11	8.0	72.00	0.0130	1669.69	4.90	5.10	1100.0	4	N
11	M110	12	8.0	482.00	0.0130	1668.13	5.10	4.05	1100.0	4	N
12	M109	3	8.0	330.00	0.0130	1658.13	4.05	4.48	1100.0	4	N
13	M107	4	6.0	235.00	0.0130	1655.10	3.95	5.15	1100.0	4	N
14	M102	19	8.0	135.00	0.0130	1650.78	6.00	5.50	1100.0	4	N
15	M105	17	6.0	582.00	0.0130	1663.13	4.70	3.55	1100.0	4	N
16	M104	17	6.0	170.00	0.0130	1650.72	2.90	3.55	1100.0	4	N
17	M103	14	6.0	171.00	0.0130	1649.80	3.55	6.00	1100.0	4	N
18	M118	19	6.0	180.00	0.0130	1669.73	4.70	5.50	1100.0	4	N
19	AMH	20	8.0	157.00	0.0130	1649.31	5.50	4.90	1100.0	4	N
20	M101	21	8.0	153.00	0.0130	1647.59	4.90	3.45	1100.0	4	N
21	M100	22	8.0	238.00	0.0130	1645.06	3.45	4.20	1100.0	4	N
22	M50	0	0.0	0.00	0.0130	1645.43	4.20	0.00	1100.0	4	N

NODE SOLUTION ORDER

SOLUTION ORDER	U.M. NO.	D.M. NO.	TRIBUTARY NODES
1	1	2	0 0 0
2	5	6	0 0 0
3	6	7	5 0 0
4	7	8	6 0 0
5	8	2	7 0 0
6	2	3	1 8 0
7	9	10	0 0 0
8	10	11	9 0 0
9	11	12	10 0 0

10	12	3	11	0	0
11	3	4	2	12	0
12	13	4	0	0	0
13	4	14	3	13	0
14	15	17	0	0	0
15	16	17	0	0	0
16	17	14	15	16	0
17	14	19	4	17	0
18	18	19	0	0	0
19	19	20	14	18	0
20	20	21	19	0	0
21	21	22	20	0	0

FLOW INPUT DATA

M.H. NO.	INPUT FLOW (cfs)	PEAK FACTOR
1	0.002	3.00
2	0.002	3.00
3	0.002	3.00
4	0.002	3.00
5	0.002	3.00
6	0.002	3.00
7	0.002	3.00
8	0.002	3.00
9	0.002	3.00
10	0.002	3.00
11	0.002	3.00
12	0.002	3.00
13	0.002	3.00
14	0.002	3.00
15	0.002	3.00
16	0.002	3.00
17	0.002	3.00
18	0.002	3.00
19	0.002	3.00
20	0.002	3.00
21	0.002	3.00
22	0.002	3.00

INFORMATION TO BE ENTERED INTO ANALYSIS

U.M. TITLE	D.M. TITLE	U.M. NO.	D.M. NO.	FLOW INTO MH. cfs	ACCUM. FLOW cfs	PEAK FLOW cfs	U.M. DEPTH ft	D.M. DEPTH ft
M115	M111	1	2	0.002	0.002	0.006	2.90	3.82
M111	M108	2	3	0.002	0.013	0.039	3.82	4.48
M108	M106	3	4	0.002	0.024	0.071	4.48	5.15
M106	M102	4	14	0.002	0.028	0.084	5.15	6.00
M214	M114	5	6	0.002	0.002	0.006	5.55	6.00
M114	M113	6	7	0.002	0.004	0.013	6.00	5.15
M113	M112	7	8	0.002	0.006	0.019	5.15	4.30
M112	M111	8	2	0.002	0.009	0.026	4.30	3.82
M119	M118	9	10	0.002	0.002	0.006	3.98	4.90
M118	M110	10	11	0.002	0.004	0.013	4.90	5.10
M110	M109	11	12	0.002	0.006	0.019	5.10	4.05
M109	M108	12	3	0.002	0.009	0.026	4.05	4.48
M107	M106	13	4	0.002	0.002	0.006	3.95	5.15
M102	AMH	14	19	0.002	0.036	0.109	6.00	5.50
M105	M103	15	17	0.002	0.002	0.006	4.70	3.55
M104	M103	16	17	0.002	0.002	0.006	2.90	3.55
M103	M102	17	14	0.002	0.006	0.019	3.55	6.00
M118	AMH	18	19	0.002	0.002	0.006	4.70	5.50

AMH	M101	19	20	0.002	0.041	0.122	5.50	4.90
M101	M100	20	21	0.002	0.043	0.129	4.90	3.45
M100	M50	21	22	0.002	0.045	0.135	3.45	4.20

PIPE SET DATA

COST DATA

EXCAVATION COST DATA		
ITEM NO.	EXCAVATION LIMITS	UNIT PRICE
	ft	ft /lin ft

BACKFILL COST MULTIPLIERS

BEDDING COST DATA

CLASS C BEDDING INCLUDED IN EXCAVATION COST
 CLASS B BEDDING AT AN ADDITIONAL COST OF 0.00 PER LINEAR FOOT

PIPE COST DATA

ITEM NO.	PIPE SIZE	UNIT PRICE
	in	/lin ft

MANHOLE COST DATA

STANDARD MANHOLE: 0.00 TO 0.00 ft DEEP WITH A MAXIMUM DROP OF
 0.00 ft AT A UNIT PRICE OF 0.00 EACH
 ADDITIONAL MANHOLE DEPTH AT A UNIT PRICE OF
 0.00 PER LINEAR FOOT.
 DROP OVER 0.00 ft THRU M.H. AT A UNIT PRICE OF
 0.00 PER LINEAR FOOT.

STREET REPAIR COST DATA

SANITARY COLLECTION SYSTEM ANALYSIS AND DESIGN

-- SOLUTION --

PIONEER POINT SEWER ANALYSIS - ZONE 2

DATE: 09-28-1984

TIME: 13:48:51

ITERATION # 1

PAGE: 1

LINK DATA				ELEVATION DATA				FLOW ANALYSIS			
U.M.	D.M.	PIPE DIA.	LINK LENGTH	UPSTREAM INVERT	MANHOLE INVERT	DOWNSTR. MH.	PIPE CAPACITY	PEAK FLOW	CONDITION	INPUT FLOW	
JITILE NO.	TITLE NO.	in	ft	ELEV. ft	ELEV. ft	DEPTH ft	VEL. cfs	DEPTH in	VEL. cfs	DEPTH in	VEL. cfs
M115	1 M111	2	340.00	+0.71	1653.43	1652.53	2.90	1650.10	3.82	0.47	2.42
M111	2 M108	3	300.00	+0.99	1653.92	1650.10	3.82	1647.13	4.48	0.56	2.84
M108	3 M106	4	156.00	+0.90	1651.61	1647.13	4.48	1643.72	5.15	0.53	2.72
M106	4 M102	14	125.00	+0.75	1650.87	1645.72	5.15	1644.78	6.00	0.49	2.48
M214	5 M114	6	12.00	+4.92	1668.16	1662.61	5.55	1662.02	6.00	1.24	6.34
M114	6 M113	7	165.00	+1.78	1668.02	1662.02	6.00	1659.08	5.15	0.75	3.81
M113	7 M112	8	263.00	+1.52	1664.23	1659.08	5.15	1655.07	4.30	0.69	3.53
M112	8 M111	2	326.00	+1.52	1659.37	1655.07	4.30	1650.10	3.82	0.69	3.53
M119	9 M118	10	227.00	+1.91	1673.10	1669.12	3.98	1664.79	4.90	1.67	4.78
M118	10 M110	11	72.00	+2.44	1669.69	1664.79	4.90	1663.03	5.10	1.89	5.41
M110	11 M109	12	482.00	+1.86	1668.13	1663.03	5.10	1654.08	4.05	1.65	4.72
M109	12 M108	3	330.00	+2.11	1658.13	1654.08	4.05	1647.13	4.48	1.75	5.02
M107	13 M106	4	235.00	+2.31	1655.10	1651.15	3.95	1645.72	5.15	0.85	4.34
M102	14 AMH	19	135.00	+0.72	1650.78	1644.78	6.00	1643.81	5.50	1.02	2.93
M105	15 M103	17	582.00	+2.09	1663.13	1658.43	4.70	1646.25	3.55	0.81	4.13
M104	16 M103	17	170.00	+0.92	1650.72	1647.82	2.90	1646.25	3.55	0.54	2.75
M103	17 M102	14	171.00	+0.86	1649.80	1646.25	3.55	1644.78	6.00	0.52	2.65
M118	18 AMH	19	180.00	+1.79	1669.73	1665.03	4.70	1643.81	5.50	1.93	9.81
AMH	19 M101	20	157.00	+0.71	1649.31	1643.81	5.50	1642.69	4.90	1.02	2.92
M101	20 M100	21	153.00	+0.71	1647.59	1642.69	4.90	1641.61	3.45	1.02	2.91
M100	21 M50	22	238.00	+0.16	1645.06	1641.61	3.45	1641.23	4.20	0.48	1.38

U.M.	D.M.	PIPE DIA.	LINK LENGTH	UPSTREAM INVERT	MANHOLE INVERT	DOWNSTR. MH.	PIPE CAPACITY	PEAK FLOW	CONDITION	INPUT FLOW	
JITILE NO.	TITLE NO.	in	ft	ELEV. ft	ELEV. ft	DEPTH ft	VEL. cfs	DEPTH in	VEL. cfs	DEPTH in	VEL. cfs
M115	1 M111	2	340.00	+0.71	1653.43	1652.53	2.90	1650.10	3.82	0.47	2.42
M111	2 M108	3	300.00	+0.99	1653.92	1650.10	3.82	1647.13	4.48	0.56	2.84
M108	3 M106	4	156.00	+0.90	1651.61	1647.13	4.48	1643.72	5.15	0.53	2.72
M106	4 M102	14	125.00	+0.75	1650.87	1645.72	5.15	1644.78	6.00	0.49	2.48
M214	5 M114	6	12.00	+4.92	1668.16	1662.61	5.55	1662.02	6.00	1.24	6.34
M114	6 M113	7	165.00	+1.78	1668.02	1662.02	6.00	1659.08	5.15	0.75	3.81
M113	7 M112	8	263.00	+1.52	1664.23	1659.08	5.15	1655.07	4.30	0.69	3.53
M112	8 M111	2	326.00	+1.52	1659.37	1655.07	4.30	1650.10	3.82	0.69	3.53
M119	9 M118	10	227.00	+1.91	1673.10	1669.12	3.98	1664.79	4.90	1.67	4.78
M118	10 M110	11	72.00	+2.44	1669.69	1664.79	4.90	1663.03	5.10	1.89	5.41
M110	11 M109	12	482.00	+1.86	1668.13	1663.03	5.10	1654.08	4.05	1.65	4.72
M109	12 M108	3	330.00	+2.11	1658.13	1654.08	4.05	1647.13	4.48	1.75	5.02
M107	13 M106	4	235.00	+2.31	1655.10	1651.15	3.95	1645.72	5.15	0.85	4.34
M102	14 AMH	19	135.00	+0.72	1650.78	1644.78	6.00	1643.81	5.50	1.02	2.93
M105	15 M103	17	582.00	+2.09	1663.13	1658.43	4.70	1646.25	3.55	0.81	4.13
M104	16 M103	17	170.00	+0.92	1650.72	1647.82	2.90	1646.25	3.55	0.54	2.75
M103	17 M102	14	171.00	+0.86	1649.80	1646.25	3.55	1644.78	6.00	0.52	2.65
M118	18 AMH	19	180.00	+1.79	1669.73	1665.03	4.70	1643.81	5.50	1.93	9.81
AMH	19 M101	20	157.00	+0.71	1649.31	1643.81	5.50	1642.69	4.90	1.02	2.92
M101	20 M100	21	153.00	+0.71	1647.59	1642.69	4.90	1641.61	3.45	1.02	2.91
M100	21 M50	22	238.00	+0.16	1645.06	1641.61	3.45	1641.23	4.20	0.48	1.38

NOT FOR BID

SANITARY COLLECTION SYSTEM ANALYSIS AND DESIGN

-- INPUT DATA --

TRONA SEWER STUDY - ZONE 1

DATE: 09-25-1984

TIME: 11:28:09

LIMITING CONSTANTS

NO. OF MANHOLES = 95

NO. OF LAST MH. = 80

FLOW DESIGN CONSTANTS

SYSTEM PEAK FACTOR = 3

MINOR HEAD LOSS COEFFICIENT = 0

N VALUE VARIABLE WITH FLOW DEPTH

MANNING N FACTOR = .013

DESIGN CRITERIA

ANALYSIS ONLY OF SYSTEM

NOTE: INTERMEDIATE GROUND ELEVATIONS NOT INCLUDED

MANHOLE LINK DATA

LINK NO.	U.M. TITLE	D.M. NO.	PIPE DIA. in	LINK LENGTH ft	MANNING N	GROUND ELEV. ft	U.M. DEPTH ft	D.M. DEPTH ft	COST CODE	DESIGN CRITERIA	LIFT STATION
1	MA-1	2	8.0	350.00	0.0130	1685.05	5.60	3.06	1100.0	4	N
2	MA-2	3	8.0	245.00	0.0130	1676.00	3.06	3.30	1100.0	4	N
3	MA-3	4	8.0	256.00	0.0130	1669.26	3.30	3.50	1100.0	4	N
4	MA-4	5	8.0	238.00	0.0130	1664.89	3.50	2.60	1100.0	4	N
5	MA-5	6	8.0	57.00	0.0130	1660.76	2.60	2.70	1100.0	4	N
6	MA-6	7	8.0	354.00	0.0130	1660.35	2.70	5.70	1100.0	4	N
7	MA-7	8	8.0	325.00	0.0130	1660.83	5.70	4.75	1100.0	4	N
8	MC-4	9	8.0	319.00	0.0130	1656.98	4.75	3.60	1100.0	4	N
9	MC-5	10	8.0	140.00	0.0130	1651.55	5.65	5.40	1100.0	4	N
10	M21	32	8.0	76.00	0.0130	1648.33	5.40	5.80	1100.0	4	N
11	MB-2	12	8.0	342.00	0.0130	1681.76	5.25	5.35	1100.0	4	N
12	MB-1	2	8.0	257.00	0.0130	1678.57	5.35	6.20	1100.0	4	N
13	MC-1	14	8.0	246.00	0.0130	1667.83	3.75	4.45	1100.0	4	N
14	MC-2	15	8.0	165.00	0.0130	1664.73	4.45	3.75	1100.0	4	N
15	MC-3	7	8.0	66.00	0.0130	1661.60	3.75	5.70	1100.0	4	N
16	MD-1	17	8.0	150.00	0.0130	1676.40	3.68	3.35	1100.0	4	N
17	MD-2	18	8.0	240.00	0.0130	1672.64	3.35	3.20	1100.0	4	N
18	MD-4	19	8.0	193.00	0.0130	1667.85	3.20	3.20	1100.0	4	N
19	MD-6	15	8.0	283.00	0.0130	1664.13	3.20	3.75	1100.0	4	N
20	MD-3	21	8.0	176.00	0.0130	1668.43	3.00	3.20	1100.0	4	N
21	MD-5	19	8.0	76.00	0.0130	1665.13	3.20	2.65	1100.0	4	N
22	ME-1	23	8.0	44.00	0.0130	1684.17	3.70	4.50	1100.0	4	N
23	ME-2	24	8.0	218.00	0.0130	1684.64	4.50	4.40	1100.0	4	N
24	ME-3	25	8.0	260.00	0.0130	1680.02	4.40	4.15	1100.0	4	N
25	ME-4	26	8.0	183.00	0.0130	1673.79	4.15	4.70	1100.0	4	N
26	ME-5	27	8.0	65.00	0.0130	1669.98	4.70	4.59	1100.0	4	N
27	AMH	28	8.0	113.00	0.0130	1668.27	4.59	4.40	1100.0	4	N
28	ME-7	29	8.0	293.00	0.0130	1665.31	4.40	4.20	1100.0	4	N
29	ME-8	30	8.0	130.00	0.0130	1657.41	4.20	4.45	1100.0	4	N
30	ME-8A	31	8.0	205.00	0.0130	1654.38	4.45	4.45	1100.0	4	N
31	ME-9	32	8.0	75.00	0.0130	1650.20	4.45	5.80	1100.0	4	N
32	M20	33	12.0	283.00	0.0130	1648.38	5.80	6.80	1100.0	4	N
33	M19	34	8.0	295.00	0.0130	1648.08	6.80	7.80	1100.0	4	N
34	M18	35	8.0	272.00	0.0130	1647.72	7.80	9.50	1100.0	4	N
35	M17	60	8.0	277.00	0.0130	1648.17	9.50	8.90	1100.0	4	N

36	MF-1	51	6.0	279.00	0.0130	1680.71	1.65	2.85	1100.0	4	N
37	MF-2	38	8.0	324.00	0.0130	1679.48	3.95	3.90	1100.0	4	N
38	MF-3	39	8.0	187.00	0.0130	1674.32	3.90	4.40	1100.0	4	N
39	MF-4	40	8.0	213.00	0.0130	1670.41	4.40	5.45	1100.0	4	N
40	MF-4A	41	8.0	207.00	0.0130	1665.74	5.45	3.68	1100.0	4	N
41	MF-5	42	8.0	429.00	0.0130	1660.29	3.68	2.20	1100.0	4	N
42	MF-6A	43	8.0	233.00	0.0130	1648.20	2.20	2.43	1100.0	4	N
43	MF-7	34	8.0	50.00	0.0130	1647.67	2.43	7.80	1100.0	4	N
44	MG-8	43	8.0	145.00	0.0130	1650.68	3.80	2.43	1100.0	4	N
45	MG-3	46	8.0	67.00	0.0130	1673.34	3.60	3.12	1100.0	4	N
46	MG-4	47	8.0	165.00	0.0130	1671.46	3.12	3.60	1100.0	4	N
47	MG-5	48	8.0	237.00	0.0130	1667.38	3.60	3.10	1100.0	4	N
48	MG-6	49	8.0	250.00	0.0130	1662.29	3.10	3.10	1100.0	4	N
49	MG-7	59	8.0	290.00	0.0130	1657.37	3.10	2.60	1100.0	4	N
50	MG-1	51	4.0	162.00	0.0130	1682.22	4.79	2.85	1100.0	4	N
51	MG-2	54	6.0	235.00	0.0130	1677.82	2.85	1.90	1100.0	4	N
52	MH-1	51	8.0	92.00	0.0130	1681.74	3.30	2.85	1100.0	4	N
53	MH-2	54	4.0	74.00	0.0130	1677.56	3.50	1.90	1100.0	4	N
54	MH-3	55	8.0	57.00	0.0130	1674.31	1.90	3.60	1100.0	4	N
55	MH-3A	56	8.0	254.00	0.0130	1674.60	3.60	2.95	1100.0	4	N
56	MH-4	57	8.0	269.00	0.0130	1668.12	2.95	2.10	1100.0	4	N
57	MH-5	58	8.0	253.00	0.0130	1661.08	2.10	3.00	1100.0	4	N
58	MH-6	59	8.0	305.00	0.0130	1655.78	3.00	2.60	1100.0	4	N
59	MH-7	35	8.0	195.00	0.0130	1652.50	2.60	9.50	1100.0	4	N
60	M16	61	8.0	302.00	0.0130	1646.30	8.90	8.30	1100.0	4	N
61	M15	62	8.0	295.00	0.0130	1644.40	8.30	9.10	1100.0	4	N
62	M14	74	10.0	395.00	0.0130	1643.15	9.10	5.80	1100.0	4	N
63	MI-1	64	8.0	143.00	0.0130	1668.42	3.50	3.40	1100.0	4	N
64	MI-2	65	8.0	256.00	0.0130	1665.32	3.40	3.10	1100.0	4	N
65	MI-2A	66	8.0	242.00	0.0130	1660.06	3.10	3.45	1100.0	4	N
66	MI-3	67	8.0	230.00	0.0130	1655.03	3.45	3.45	1100.0	4	N
67	MI-4	60	8.0	332.00	0.0130	1651.49	3.45	8.90	1100.0	4	N
68	MJ-1	69	6.0	350.00	0.0130	1662.38	5.00	3.90	1100.0	4	N
69	MJ-2	70	8.0	225.00	0.0130	1654.29	3.90	4.05	1100.0	4	N
70	MJ-3	71	8.0	180.00	0.0130	1649.64	4.05	4.50	1100.0	4	N
71	MJ-4	61	8.0	101.00	0.0130	1646.53	4.50	8.30	1100.0	4	N
72	MK-2	73	8.0	233.00	0.0130	1652.25	3.45	3.68	1100.0	4	N
73	MK-3	62	8.0	196.00	0.0130	1646.70	3.68	9.10	1100.0	4	N
74	M13	75	10.0	108.00	0.0130	1638.52	5.80	7.50	1100.0	4	N
75	M12A	76	10.0	208.00	0.0130	1640.21	7.50	7.65	1100.0	4	N
76	M12	77	10.0	378.00	0.0130	1640.19	7.65	8.00	1100.0	4	N
77	M11	78	10.0	356.00	0.0130	1639.53	8.00	9.11	1100.0	4	N
78	M10	79	10.0	194.00	0.0130	1639.62	9.11	10.40	1100.0	4	N
79	M9	80	10.0	44.00	0.0130	1640.37	10.40	3.70	1100.0	4	N
80	M22	0	0.0	0.00	0.0130	1633.54	3.70	0.00	1100.0	4	N
81	ML-1	82	8.0	171.00	0.0130	1661.41	2.87	4.25	1100.0	4	N
82	ML-2	83	8.0	295.00	0.0130	1658.61	4.25	6.55	1100.0	4	N
83	ML-4	84	8.0	122.00	0.0130	1651.60	6.55	6.65	1100.0	4	N
84	ML-3	76	8.0	364.00	0.0130	1651.25	6.65	7.65	1100.0	4	N
85	MM-1	86	8.0	156.00	0.0130	1656.93	3.68	4.00	1100.0	4	N
86	MM-2	87	8.0	366.00	0.0130	1656.28	4.00	4.22	1100.0	4	N
87	MM-3	88	8.0	260.00	0.0130	1652.23	4.22	1.83	1100.0	4	N
88	MM-5	89	8.0	100.00	0.0130	1645.98	1.83	3.05	1100.0	4	N
89	MM-6	90	8.0	299.00	0.0130	1644.61	3.05	3.20	1100.0	4	N
90	MM-6A	76	8.0	278.00	0.0130	1642.65	3.20	7.65	1100.0	4	N
91	MM-8	90	8.0	105.00	0.0130	1644.64	2.25	3.20	1100.0	4	N
92	MM-7	93	8.0	287.00	0.0130	1649.69	2.42	2.85	1100.0	4	N
93	MM-4	88	8.0	243.00	0.0130	1647.53	2.85	1.83	1100.0	4	N
94	MM-6B	89	8.0	299.00	0.0130	1646.34	3.45	3.05	1100.0	4	N
95	ME-6	27	8.0	55.00	0.0130	1669.66	4.30	4.59	1100.0	4	N

NODE SOLUTION ORDER					
SOLUTION	U.M.	D.M.	TRIBUTARY NODES		
ORDER	NO.	NO.	1	2	3
1	1	2	0	0	0
2	11	12	0	0	0
3	12	2	11	0	0
4	2	3	1	12	0
5	3	4	2	0	0
6	4	5	3	0	0
7	5	6	4	0	0
8	6	7	5	0	0
9	13	14	0	0	0
10	14	15	13	0	0
11	16	17	0	0	0
12	17	18	16	0	0
13	18	19	17	0	0
14	20	21	0	0	0
15	21	19	20	0	0
16	19	15	18	21	0
17	15	7	14	19	0
18	7	8	6	15	0
19	8	9	7	0	0
20	9	10	8	0	0
21	10	32	9	0	0
22	22	23	0	0	0
23	23	24	22	0	0
24	24	25	23	0	0
25	25	26	24	0	0
26	26	27	25	0	0
27	27	28	0	0	0
28	27	28	26	27	0
29	28	29	27	0	0
30	29	30	28	0	0
31	30	31	29	0	0
32	31	32	30	0	0
33	32	33	10	31	0
34	33	34	32	0	0
35	37	38	0	0	0
36	38	39	37	0	0
37	39	40	38	0	0
38	40	41	39	0	0
39	41	42	40	0	0
40	42	43	41	0	0
41	44	43	0	0	0
42	43	34	42	44	0
43	34	35	33	43	0
44	45	46	0	0	0
45	46	47	45	0	0
46	47	48	46	0	0
47	48	49	47	0	0
48	49	59	48	0	0
49	36	51	0	0	0
50	50	51	0	0	0
51	52	51	0	0	0
52	51	54	36	50	52
53	53	54	0	0	0
54	54	55	51	53	0
55	55	56	54	0	0
56	56	57	55	0	0

57	57	58	56	0	0
58	58	59	57	0	0
59	59	35	49	58	0
60	35	60	34	59	0
61	63	64	0	0	0
62	64	65	63	0	0
63	65	66	64	0	0
64	66	67	65	0	0
65	67	60	66	0	0
66	60	61	35	67	0
67	68	69	0	0	0
68	69	70	68	0	0
69	70	71	69	0	0
70	71	61	70	0	0
71	61	62	60	71	0
72	72	73	0	0	0
73	73	62	72	0	0
74	62	74	61	73	0
75	74	75	62	0	0
76	75	76	74	0	0
77	81	82	0	0	0
78	82	83	81	0	0
79	83	84	82	0	0
80	84	76	83	0	0
81	85	86	0	0	0
82	86	87	85	0	0
83	87	88	86	0	0
84	92	93	0	0	0
85	93	88	92	0	0
86	88	89	87	93	0
87	94	89	0	0	0
88	89	90	88	94	0
89	91	90	0	0	0
90	90	76	89	91	0
91	76	77	75	84	90
92	77	78	76	0	0
93	78	79	77	0	0
94	79	80	78	0	0

FLOW INPUT DATA

M.H. NO.	INPUT FLOW (cfs)	PEAK FACTOR
1	0.002	3.00
2	0.002	3.00
3	0.002	3.00
4	0.002	3.00
5	0.002	3.00
6	0.002	3.00
7	0.002	3.00
8	0.002	3.00
9	0.002	3.00
10	0.002	3.00
11	0.002	3.00
12	0.002	3.00
13	0.002	3.00
14	0.002	3.00
15	0.002	3.00
16	0.002	3.00
17	0.002	3.00
18	0.002	3.00
19	0.002	3.00

20	0.002	3.00
21	0.002	3.00
22	0.002	3.00
23	0.002	3.00
24	0.002	3.00
25	0.002	3.00
26	0.002	3.00
27	0.002	3.00
28	0.002	3.00
29	0.002	3.00
30	0.002	3.00
31	0.002	3.00
32	0.002	3.00
33	0.002	3.00
34	0.002	3.00
35	0.002	3.00
36	0.002	3.00
37	0.002	3.00
38	0.002	3.00
39	0.002	3.00
40	0.002	3.00
41	0.002	3.00
42	0.002	3.00
43	0.002	3.00
44	0.002	3.00
45	0.002	3.00
46	0.002	3.00
47	0.002	3.00
48	0.002	3.00
49	0.002	3.00
50	0.002	3.00
51	0.002	3.00
52	0.002	3.00
53	0.002	3.00
54	0.002	3.00
55	0.002	3.00
56	0.002	3.00
57	0.002	3.00
58	0.002	3.00
59	0.002	3.00
60	0.002	3.00
61	0.002	3.00
62	0.002	3.00
63	0.002	3.00
64	0.002	3.00
65	0.002	3.00
66	0.002	3.00
67	0.002	3.00
68	0.002	3.00
69	0.002	3.00
70	0.002	3.00
71	0.002	3.00
72	0.002	3.00
73	0.002	3.00
74	0.002	3.00
75	0.002	3.00
76	0.002	3.00
77	0.002	3.00
78	0.002	3.00
79	0.002	3.00

80	0.002	3.00
81	0.002	3.00
82	0.002	3.00
83	0.002	3.00
84	0.002	3.00
85	0.002	3.00
86	0.002	3.00
87	0.002	3.00
88	0.002	3.00
89	0.002	3.00
90	0.002	3.00
91	0.002	3.00
92	0.002	3.00
93	0.002	3.00
94	0.002	3.00
95	0.002	3.00

INFORMATION TO BE ENTERED INTO ANALYSIS

U.M. TITLE	D.M. TITLE	U.M. NO.	D.M. NO.	FLOW INTO MH. cfs	ACCUM. FLOW cfs	PEAK FLOW cfs	U.M. DEPTH ft	D.M. DEPTH ft
MA-1	MA-2	1	2	0.002	0.002	0.006	5.60	3.06
MA-2	MA-3	2	3	0.002	0.009	0.026	3.06	3.30
MA-3	MA-4	3	4	0.002	0.011	0.032	3.30	3.50
MA-4	MA-5	4	5	0.002	0.013	0.039	3.50	2.60
MA-5	MA-6	5	6	0.002	0.015	0.045	2.60	2.70
MA-6	MA-7	6	7	0.002	0.017	0.051	2.70	5.70
MA-7	MC-4	7	8	0.002	0.039	0.116	5.70	4.75
MC-4	MC-5	8	9	0.002	0.041	0.122	4.75	3.60
MC-5	M21	9	10	0.002	0.043	0.129	5.65	5.40
M21	M20	10	32	0.002	0.045	0.135	5.40	5.80
MB-2	MB-1	11	12	0.002	0.002	0.006	5.25	5.35
MB-1	MA-2	12	2	0.002	0.004	0.013	5.35	6.20
MC-1	MC-2	13	14	0.002	0.002	0.006	3.75	4.45
MC-2	MC-3	14	15	0.002	0.004	0.013	4.45	3.75
MC-3	MA-7	15	7	0.002	0.019	0.058	3.75	5.70
MD-1	MD-2	16	17	0.002	0.002	0.006	3.68	3.35
MD-2	MD-4	17	18	0.002	0.004	0.013	3.35	3.20
MD-4	MD-6	18	19	0.002	0.006	0.019	3.20	3.20
MD-6	MC-3	19	15	0.002	0.013	0.039	3.20	3.75
MD-3	MD-5	20	21	0.002	0.002	0.006	3.00	3.20
MD-5	MD-6	21	19	0.002	0.004	0.013	3.20	2.65
ME-1	ME-2	22	23	0.002	0.002	0.006	3.70	4.50
ME-2	ME-3	23	24	0.002	0.004	0.013	4.50	4.40
ME-3	ME-4	24	25	0.002	0.006	0.019	4.40	4.15
ME-4	ME-5	25	26	0.002	0.009	0.026	4.15	4.70
ME-5	AMH	26	27	0.002	0.011	0.032	4.70	4.59
AMH	ME-7	27	28	0.002	0.015	0.045	4.59	4.40
ME-7	ME-8	28	29	0.002	0.017	0.051	4.40	4.20
ME-8	ME-8A	29	30	0.002	0.019	0.058	4.20	4.45
ME-8A	ME-9	30	31	0.002	0.021	0.064	4.45	4.45
ME-9	M20	31	32	0.002	0.024	0.071	4.45	5.80
M20	M19	32	33	0.002	0.071	0.212	5.80	6.80
M19	M18	33	34	0.002	0.073	0.219	6.80	7.80
M18	M17	34	35	0.002	0.092	0.276	7.80	9.50
M17	M16	35	60	0.002	0.129	0.386	9.50	8.90
MF-1	MG-2	36	51	0.002	0.002	0.006	1.65	2.85
MF-2	MF-3	37	38	0.002	0.002	0.006	3.95	3.90
MF-3	MF-4	38	39	0.002	0.004	0.013	3.90	4.40
MF-4	MF-4A	39	40	0.002	0.006	0.019	4.40	5.45

MF-4A	MF-5	40	41	0.002	0.009	0.026	5.45	3.68
MF-5	MF-6A	41	42	0.002	0.011	0.032	3.68	2.20
MF-6A	MF-7	42	43	0.002	0.013	0.039	2.20	2.43
MF-7	M1B	43	34	0.002	0.017	0.051	2.43	7.80
MG-8	MF-7	44	43	0.002	0.002	0.006	3.80	2.43
MG-3	MG-4	45	46	0.002	0.002	0.006	3.60	3.12
MG-4	MG-5	46	47	0.002	0.004	0.013	3.12	3.60
MG-5	MG-6	47	48	0.002	0.006	0.019	3.60	3.10
MG-6	MG-7	48	49	0.002	0.009	0.026	3.10	3.10
MG-7	MH-7	49	59	0.002	0.011	0.032	3.10	2.60
MG-1	MG-2	50	51	0.002	0.002	0.006	4.79	2.85
MG-2	MH-3	51	54	0.002	0.009	0.026	2.85	1.90
MH-1	MG-2	52	51	0.002	0.002	0.006	3.30	2.85
MH-2	MH-3	53	54	0.002	0.002	0.006	3.50	1.90
MH-3	MH-3A	54	55	0.002	0.013	0.039	1.90	3.60
MH-3A	MH-4	55	56	0.002	0.015	0.045	3.60	2.95
MH-4	MH-5	56	57	0.002	0.017	0.051	2.95	2.10
MH-5	MH-6	57	58	0.002	0.019	0.058	2.10	3.00
MH-6	MH-7	58	59	0.002	0.021	0.064	3.00	2.60
MH-7	M17	59	35	0.002	0.034	0.103	2.60	9.50
M16	M15	60	61	0.002	0.141	0.424	8.90	8.30
M15	M14	61	62	0.002	0.152	0.456	8.30	9.10
M14	M13	62	74	0.002	0.159	0.476	9.10	5.80
MI-1	MI-2	63	64	0.002	0.002	0.006	3.50	3.40
MI-2	MI-2A	64	65	0.002	0.004	0.013	3.40	3.10
MI-2A	MI-3	65	66	0.002	0.006	0.019	3.10	3.45
MI-3	MI-4	66	67	0.002	0.009	0.026	3.45	3.45
MI-4	M16	67	60	0.002	0.011	0.032	3.45	8.90
MJ-1	MJ-2	68	69	0.002	0.002	0.006	5.00	3.90
MJ-2	MJ-3	69	70	0.002	0.004	0.013	3.90	4.05
MJ-3	MJ-4	70	71	0.002	0.006	0.019	4.05	4.50
MJ-4	M15	71	61	0.002	0.009	0.026	4.50	8.30
MK-2	MK-3	72	73	0.002	0.002	0.006	3.45	3.68
MK-3	M14	73	62	0.002	0.004	0.013	3.68	9.10
M13	M12A	74	75	0.002	0.161	0.482	5.80	7.50
M12A	M12	75	76	0.002	0.163	0.489	7.50	7.65
M12	M11	76	77	0.002	0.195	0.585	7.65	8.00
M11	M10	77	78	0.002	0.197	0.591	8.00	9.11
M10	M9	78	79	0.002	0.199	0.598	9.11	10.40
M9	M22	79	80	0.002	0.201	0.604	10.40	3.70
ML-1	ML-2	81	82	0.002	0.002	0.006	2.87	4.25
ML-2	ML-4	82	83	0.002	0.004	0.013	4.25	6.55
ML-4	ML-3	83	84	0.002	0.006	0.019	6.55	6.65
ML-3	M12	84	76	0.002	0.009	0.026	6.65	7.65
MM-1	MM-2	85	86	0.002	0.002	0.006	3.68	4.00
MM-2	MM-3	86	87	0.002	0.004	0.013	4.00	4.22
MM-3	MM-5	87	88	0.002	0.006	0.019	4.22	1.83
MM-5	MM-6	88	89	0.002	0.013	0.039	1.83	3.05
MM-6	MM-6A	89	90	0.002	0.017	0.051	3.05	3.20
MM-6A	M12	90	76	0.002	0.021	0.064	3.20	7.65
MM-8	MM-6A	91	90	0.002	0.002	0.006	2.25	3.20
MM-7	MM-4	92	93	0.002	0.002	0.006	2.42	2.85
MM-4	MM-5	93	88	0.002	0.004	0.013	2.85	1.83
MM-6B	MM-6	94	89	0.002	0.002	0.006	3.45	3.05
ME-6	AMH	95	27	0.002	0.002	0.006	4.30	4.59

PIPE SET DATA

COST DATA

EXCAVATION COST DATA

ITEM NO.	EXCAVATION LIMITS	UNIT PRICE
	ft ft	/lin ft

BACKFILL COST MULTIPLIERS

BEDDING COST DATA

CLASS C BEDDING INCLUDED IN EXCAVATION COST
CLASS B BEDDING AT AN ADDITIONAL COST OF 0.00 PER LINEAR FOOT

PIPE COST DATA

ITEM NO.	PIPE SIZE	UNIT PRICE
	in	/lin ft

MANHOLE COST DATA

STANDARD MANHOLE: 0.00 TO 0.00 ft DEEP WITH A MAXIMUM DROP OF
0.00 ft AT A UNIT PRICE OF 0.00 EACH.
ADDITIONAL MANHOLE DEPTH AT A UNIT PRICE OF
0.00 PER LINEAR FOOT.
DROP OVER 0.00 ft THRU M.H. AT A UNIT PRICE OF
0.00 PER LINEAR FOOT.

STREET REPAIR COST DATA

SANITARY COLLECTION SYSTEM ANALYSIS AND DESIGN

TRONA SEWER STUDY - ZONE 1

-- SOLUTION --

DATE: 09-25-1984

TIME: 11:37:10

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ITERATION #1

LINK DATA				ELEVATION DATA				FLOW ANALYSIS			
U.M.	D.M.	PIPE DIA.	LINK LENGTH	UPSTREAM MANHOLE	DOWNSTR. MH.	INVERT	DEPTH	PIPE CAPACITY	PEAK FLOW	CONDITION	INPUT FLOW
TITLE NO.	TITLE NO.	in	ft	ELEV. ft	ELEV. ft	ft	ft	---FLOW cfs	---FLOW cfs	---FLOW cfs	---FLOW cfs
1	2	3	4	5	6	7	8	9	10	11	12
MA-1	1 MA-2	2	8.0	350.00	+1.86	1685.05	1679.45	5.60	1672.94	3.06	1.65
MA-2	2 MA-3	3	8.0	245.00	+2.85	1676.00	1672.94	3.06	1665.96	3.30	2.04
MA-3	3 MA-4	4	8.0	256.00	+1.79	1669.26	1665.96	3.30	1661.39	3.50	1.61
MA-4	4 MA-5	5	8.0	238.00	+1.36	1664.89	1661.39	3.50	1658.16	2.60	1.41
MA-5	5 MA-6	6	8.0	57.00	+0.89	1660.76	1658.16	2.60	1657.65	2.70	1.14
MA-6	6 MA-7	7	8.0	354.00	+0.71	1660.35	1657.65	2.70	1655.13	5.70	1.02
MA-7	7 MC-4	8	8.0	325.00	+0.89	1660.83	1655.13	5.70	1652.23	4.75	1.14
MC-4	8 MC-5	9	8.0	319.00	+1.34	1656.98	1652.23	4.75	1647.95	3.60	1.40
MC-5	9 MC-1	10	8.0	140.00	+2.12	1651.55	1647.95	3.60	1642.93	5.40	1.76
MC-1	10 MC-2	11	8.0	76.00	+0.46	1648.33	1642.93	5.40	1642.58	5.80	0.82
MC-2	11 MC-3	12	8.0	342.00	+0.96	1681.76	1676.51	5.25	1673.22	5.35	1.19
MC-3	12 MC-4	13	8.0	257.00	+1.34	1678.57	1673.22	5.35	1669.80	6.20	1.39
MC-4	13 MC-5	14	8.0	246.00	+1.54	1667.83	1669.80	6.20	1660.28	4.45	1.50
MC-5	14 MC-6	15	8.0	165.00	+1.47	1664.73	1660.28	4.45	1657.85	3.75	1.47
MC-6	15 MC-7	16	8.0	66.00	+4.12	1661.60	1657.85	3.75	1655.13	5.70	2.45
MC-7	16 MC-8	17	8.0	150.00	+2.29	1676.40	1672.72	3.68	1669.29	3.35	1.83
MC-8	17 MC-9	18	8.0	240.00	+1.93	1672.64	1669.29	3.35	1664.65	3.20	1.68
MC-9	18 MC-10	19	8.0	193.00	+1.93	1667.85	1664.65	3.20	1660.93	3.20	1.68
MC-10	19 MC-11	20	8.0	283.00	+1.09	1664.13	1660.93	3.20	1657.85	3.75	1.26
MC-11	20 MC-12	21	8.0	176.00	+0.99	1668.43	1661.93	3.00	1661.93	3.20	1.70
MC-12	21 MC-13	22	8.0	44.00	+0.75	1684.17	1680.47	3.70	1680.14	4.50	1.05
MC-13	22 MC-14	23	8.0	218.00	+2.07	1684.64	1680.14	4.50	1675.62	4.40	1.74
MC-14	23 MC-15	24	8.0	260.00	+2.30	1680.02	1675.62	4.40	1669.64	4.15	1.83
MC-15	24 MC-16	25	8.0	183.00	+2.38	1673.79	1669.64	4.15	1665.28	4.70	1.87
MC-16	25 MC-17	26	8.0	65.00	+2.46	1669.98	1665.28	4.70	1663.68	4.59	1.90
MC-17	26 MC-18	27	8.0	113.00	+2.45	1668.27	1663.68	4.59	1660.91	4.40	1.89
MC-18	27 MC-19	28	8.0	293.00	+2.63	1665.31	1660.91	4.40	1653.21	4.20	1.96
MC-19	28 MC-20	29	8.0	130.00	+2.62	1657.41	1653.21	4.20	1649.93	4.45	1.92
MC-20	29 MC-21	30	8.0	205.00	+2.04	1654.38	1649.93	4.45	1645.75	4.45	1.73
MC-21	30 MC-22	31	8.0	75.00	+4.23	1650.20	1645.75	4.45	1642.58	5.80	2.48
MC-22	31 MC-23	32	8.0	283.00	+0.46	1648.38	1642.58	5.80	1641.28	6.80	2.41
MC-23	32 MC-24	33	8.0	295.00	+0.46	1648.08	1641.28	6.80	1639.92	7.80	0.82
MC-24	33 MC-25	34	8.0	272.00	+0.46	1648.17	1639.92	7.80	1637.40	8.90	0.82
MC-25	34 MC-26	35	8.0	277.00	+0.46	1648.17	1637.40	8.90	1634.67	9.50	0.82
MC-26	35 MC-27	36	8.0	279.00	+1.47	1680.71	1679.06	1.65	1674.97	2.85	0.68
MC-27	36 MC-28	37	8.0	324.00	+1.58	1679.48	1675.53	3.95	1670.42	3.90	1.52
MC-28	37 MC-29	38	8.0	187.00	+2.36	1674.32	1670.42	3.90	1666.01	4.40	1.86
MC-29	38 MC-30	39	8.0	213.00	+2.69	1670.41	1666.01	4.40	1660.29	5.45	1.98
MC-30	39 MC-31	40	8.0	207.00	+1.78	1665.74	1660.29	5.45	1656.61	3.68	1.61
MC-31	40 MC-32	41	8.0	429.00	+2.47	1660.29	1656.61	3.68	1646.00	2.20	1.90
MC-32	41 MC-33	42	8.0	233.00	+0.33	1648.20	1646.00	2.20	1645.24	2.43	0.69
MC-33	42 MC-34	43	8.0	233.00	+0.33	1648.20	1646.00	2.20	1645.24	2.43	0.69

COMPUTER NUMBER IN NUMERICAL SEQUENCE

DRAWING MANHOLE NUMBER

SANITARY COLLECTION SYSTEM ANALYSIS AND DESIGN

-- SOLUTION --

TRONA SEWER STUDY - ZONE 1

DATE: 09-25-1984

TIME: 11:42:07

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ITERATION # 1

LINK DATA		ELEVATION DATA				FLOW ANALYSIS									
U.M.	D.M.	LINK	LINK	UPSTREAM	MANHOLE	DOWNSTR.	MH.	PIPE	PIPE	PEAK	FLOW	CONDITION	INPUT	FLOW	
TITLE NO.	TITLE NO.	LENGTH	SLOPE	--- ELEV. ---	INVERT	--- MH. ---	DEPTH	--- FT ---	--- CAPACITY ---	--- FLOW ---	--- FLOW ---	--- FLOW ---	--- FLOW ---	--- FLOW ---	--- FLOW ---
		in		ft	ft	ft	ft	ft	cfs	cfs	cfs	in	in	in	in
MF-7	43	8.0	+10.64	1647.67	1645.24	2.43	1639.92	7.80	3.94	11.29	0.05	3.37	0.68	0.02	2.31
MG-8	44	8.0	+1.13	1650.68	1646.88	3.80	1645.24	2.43	1.29	3.68	0.01	0.87	0.44	0.00	0.29
MG-3	45	8.0	+2.09	1673.34	1669.74	3.60	1668.34	3.12	1.75	5.00	0.01	0.87	0.32	0.00	0.29
MG-4	46	8.0	+2.76	1671.46	1668.34	3.12	1663.78	3.60	2.01	5.75	0.01	1.43	0.49	0.00	0.58
MG-5	47	8.0	+1.94	1667.38	1663.78	3.60	1659.19	3.10	1.68	4.82	0.02	1.40	0.65	0.01	0.87
MG-6	48	8.0	+1.97	1662.29	1659.19	3.10	1654.27	3.10	1.70	4.86	0.03	1.50	0.73	0.01	1.14
MG-7	49	8.0	+1.51	1657.37	1654.27	3.10	1649.90	2.60	1.48	4.25	0.03	1.46	0.87	0.01	1.09
MG-1	50	8.0	+1.52	1682.22	1677.43	4.79	1674.97	2.85	0.23	2.69	0.01	1.00	0.50	0.00	0.74
MG-2	51	8.0	+1.09	1677.82	1674.97	2.85	1672.41	1.90	0.59	2.98	0.03	1.28	0.95	0.01	0.91
MH-1	52	8.0	+3.77	1681.74	1678.44	3.30	1674.97	2.85	2.35	6.72	0.01	0.87	0.24	0.00	0.29
MH-2	53	8.0	+2.23	1677.56	1674.06	3.50	1672.41	1.90	0.28	3.26	0.01	1.13	0.44	0.00	0.84
MH-3	54	8.0	+2.47	1674.31	1672.41	1.90	1671.00	3.60	1.90	5.44	0.04	1.83	0.84	0.01	1.37
MH-3A	55	8.0	+2.30	1674.60	1671.00	3.60	1665.17	2.95	1.83	5.24	0.05	1.88	0.93	0.02	1.39
MH-4	56	8.0	+2.30	1668.12	1665.17	2.95	1658.98	2.10	1.83	5.25	0.05	1.98	1.01	0.02	1.45
MH-5	57	8.0	+2.45	1661.08	1658.98	2.10	1652.78	3.00	1.89	5.42	0.06	2.11	1.06	0.02	1.53
MH-6	58	8.0	+0.94	1655.78	1652.78	3.00	1649.90	2.60	1.17	3.36	0.06	1.53	1.41	0.02	1.09
MH-7	59	8.0	+5.76	1652.50	1649.90	2.60	1638.67	9.50	2.90	8.31	0.10	3.35	1.13	0.03	2.42
MH-8	60	8.0	+0.43	1646.30	1637.40	8.90	1636.10	8.30	0.79	2.27	0.42	1.99	4.70	0.14	1.46
MH-9	61	8.0	+0.69	1644.40	1636.10	8.30	1634.05	9.10	1.01	2.89	0.46	2.41	4.22	0.15	1.77
MH-10	62	8.0	+0.34	1643.15	1634.05	9.10	1632.72	5.80	1.27	2.33	0.48	1.85	4.68	0.16	1.55
MH-11	63	8.0	+2.10	1648.42	1644.92	3.50	1641.92	3.40	1.75	5.01	0.01	0.87	0.32	0.00	0.29
MH-12	64	8.0	+1.94	1645.32	1641.92	3.40	1636.96	3.10	1.68	4.82	0.01	1.25	0.53	0.00	0.58
MH-13	65	8.0	+2.22	1640.06	1636.96	3.10	1631.58	3.45	1.50	4.29	0.03	1.37	0.77	0.01	1.04
MH-14	66	8.0	+1.54	1635.03	1631.58	3.45	1628.04	3.45	2.16	6.20	0.03	1.91	0.72	0.01	1.44
MH-15	67	8.0	+3.20	1631.49	1628.04	3.45	1624.00	3.90	0.79	4.04	0.01	1.07	0.41	0.00	0.51
MH-16	68	8.0	+2.00	1626.38	1624.00	2.38	1620.39	3.90	1.76	5.06	0.01	1.30	0.52	0.00	0.58
MH-17	69	8.0	+2.13	1624.29	1620.39	3.90	1615.59	4.05	1.70	4.87	0.02	1.41	0.65	0.01	0.87
MH-18	70	8.0	+1.98	1619.64	1615.59	4.05	1612.03	4.50	2.93	8.39	0.03	2.27	0.57	0.01	1.15
MH-19	71	8.0	+5.87	1616.53	1612.03	4.50	1606.10	8.30	1.90	5.45	0.01	0.87	0.29	0.00	0.29
MH-20	72	8.0	+2.48	1612.25	1608.80	3.45	1603.02	3.68	2.59	7.41	0.01	1.73	0.43	0.00	0.58
MH-21	73	8.0	+4.58	1606.70	1603.02	3.68	1604.05	9.10	0.21	0.39	0.48				
MH-22	74	8.0	+0.01	1608.52	1604.05	4.47	1602.71	7.50	0.63	1.15	0.49	1.13	7.40	0.16	0.82
MH-23	75	8.0	+0.08	1602.21	1602.71	0.50	1602.54	7.65	1.13	2.08	0.59	1.80	5.76	0.20	1.32
MH-24	76	8.0	+0.27	1600.19	1602.54	2.35	1600.51	9.11	1.17	2.15	0.59	1.85	5.68	0.20	1.36
MH-25	77	8.0	+0.28	1603.53	1600.51	3.02	1600.51	9.11	1.19	2.12	0.60	1.84	5.76	0.20	1.35
MH-26	78	8.0	+0.28	1603.62	1600.51	3.11	1600.51	9.11	1.19	2.12	0.60	1.84	5.76	0.20	1.35
MH-27	79	8.0	+0.28	1603.62	1600.51	3.11	1600.51	9.11	1.19	2.12	0.60	1.84	5.76	0.20	1.35
MH-28	80	8.0	+0.28	1603.62	1600.51	3.11	1600.51	9.11	1.19	2.12	0.60	1.84	5.76	0.20	1.35
MH-29	81	8.0	+2.44	1601.41	1600.51	0.90	1600.51	9.11	1.19	2.12	0.60	1.84	5.76	0.20	1.35
MH-30	82	8.0	+3.16	1601.41	1600.51	0.90	1600.51	9.11	1.19	2.12	0.60	1.84	5.76	0.20	1.35
MH-31	83	8.0	+0.37	1601.60	1600.51	1.10	1600.51	9.11	1.19	2.12	0.60	1.84	5.76	0.20	1.35
MH-32	84	8.0	+0.37	1601.60	1600.51	1.10	1600.51	9.11	1.19	2.12	0.60	1.84	5.76	0.20	1.35
MH-33	85	8.0	+3.31	1601.25	1600.51	0.74	1600.51	9.11	1.19	2.12	0.60	1.84	5.76	0.20	1.35
MH-34	86	8.0	+3.31	1601.25	1600.51	0.74	1600.51	9.11	1.19	2.12	0.60	1.84	5.76	0.20	1.35
MH-35	87	8.0	+3.31	1601.25	1600.51	0.74	1600.51	9.11	1.19	2.12	0.60	1.84	5.76	0.20	1.35
MH-36	88	8.0	+3.31	1601.25	1600.51	0.74	1600.51	9.11	1.19	2.12	0.60	1.84	5.76	0.20	1.35
MH-37	89	8.0	+3.31	1601.25	1600.51	0.74	1600.51	9.11	1.19	2.12	0.60	1.84	5.76	0.20	1.35
MH-38	90	8.0	+3.31	1601.25	1600.51	0.74	1600.51	9.11	1.19	2.12	0.60	1.84	5.76	0.20	1.35
MH-39	91	8.0	+3.31	1601.25	1600.51	0.74	1600.51	9.11	1.19	2.12	0.60	1.84	5.76	0.20	1.35
MH-40	92	8.0	+3.31	1601.25	1600.51	0.74	1600.51	9.11	1.19	2.12	0.60	1.84	5.76	0.20	1.35
MH-41	93	8.0	+3.31	1601.25	1600.51	0.74	1600.51	9.11	1.19	2.12	0.60	1.84	5.76	0.20	1.35
MH-42	94	8.0	+3.31	1601.25	1600.51	0.74	1600.51	9.11	1.19	2.12	0.60	1.84	5.76	0.20	1.35
MH-43	95	8.0	+3.31	1601.25	1600.51	0.74	1600.51	9.11	1.19	2.12	0.60	1.84	5.76	0.20	1.35
MH-44	96	8.0	+3.31	1601.25	1600.51	0.74	1600.51	9.11	1.19	2.12	0.60	1.84	5.76	0.20	1.35
MH-45	97	8.0	+3.31	1601.25	1600.51	0.74	1600.51	9.11	1.19	2.12	0.60	1.84	5.76	0.20	1.35
MH-46	98	8.0	+3.31	1601.25	1600.51	0.74	1600.51	9.11	1.19	2.12	0.60	1.84	5.76	0.20	1.35
MH-47	99	8.0	+3.31	1601.25	1600.51	0.74	1600.51	9.11	1.19	2.12	0.60	1.84	5.76	0.20	1.35
MH-48	100	8.0	+3.31	1601.25	1600.51	0.74	1600.51	9.11	1.19	2.12	0.60	1.84	5.76	0.20	1.35

DEPTH OF SURCHARGE IS NEGLIGIBLE

SANITARY COLLECTION SYSTEM ANALYSIS AND DESIGN

-- SOLUTION --

TRONA SEWER STUDY - ZONE 1

DATE: 09-25-1984

TIME: 11:46:50

ITERATION # 1

PAGE: 3

LINK DATA				ELEVATION DATA				FLOW ANALYSIS									
U.M. TITLE NO.	D.M. TITLE NO.	PIPE DIA.	LINK LENGTH	LINK SLOPE	UPSTREAM GROUND ELEV.	UPSTREAM INVERT ELEV.	MANHOLE INVERT ELEV.	DOWNSTR. INVERT ELEV.	MANHOLE DEPTH	DOWNSTR. PIPE CAPACITY	PIPE VELOCITY	PEAK FLOW VELOCITY	CONDITION	INPUT FLOW VELOCITY	CONDITION	DEPTH	VELOCITY
		in	ft		ft	ft	ft	ft	ft	cfs	fps	cfs	fps	cfs	fps	in	fps
MM-1	85 MM-2	86	156.00	+0.62	1656.93	1653.25	3.68	1652.28	4.00	0.95	2.73	0.01	0.69	0.00	0.00	0.29	0.20
MM-2	86 MM-3	87	366.00	+1.17	1656.28	1652.28	4.00	1648.01	4.22	1.31	3.74	0.01	1.05	0.00	0.58	0.29	0.29
MM-3	87 MM-5	88	260.00	+1.48	1652.23	1648.01	4.22	1644.15	1.83	1.47	4.22	0.02	1.26	0.01	0.87	0.38	0.38
MM-5	88 MM-6	89	100.00	+2.59	1645.98	1644.15	1.83	1641.56	3.05	1.94	5.57	0.04	1.86	0.01	1.39	0.49	0.49
MM-6	89 MM-6A	90	299.00	+0.71	1644.61	1641.56	3.05	1639.45	3.20	1.02	2.91	0.05	1.30	0.02	0.93	0.77	0.77
MM-6A	90 M12	76	278.00	+2.49	1642.65	1639.45	3.20	1632.54	7.65	1.91	5.46	0.06	2.17	1.11	0.02	1.58	0.64
MM-8	91 MM-6A	90	105.00	+2.80	1644.64	1642.39	2.25	1639.45	3.20	2.02	5.79	0.01	0.87	0.00	0.29	0.09	0.09
MM-7	92 MM-4	93	287.00	+0.90	1649.69	1647.27	2.42	1644.68	2.85	1.15	3.29	0.01	0.79	0.00	0.29	0.16	0.16
MM-4	93 MM-5	88	243.00	+0.22	1647.53	1644.68	2.85	1644.15	1.83	0.56	1.62	0.01	0.56	0.00	0.42	0.53	0.53
MM-6B	94 MM-6	89	299.00	+0.44	1646.34	1642.89	3.45	1641.56	3.05	0.81	2.31	0.01	0.61	0.00	0.29	0.23	0.23
ME-6	95 AMH	27	55.00	+3.05	1669.66	1665.36	4.30	1663.68	4.59	2.11	6.05	0.01	0.87	0.00	0.29	0.09	0.09

NOTE: OTHER MANHOLES IN THE SYSTEM MAY ALSO BE SURCHARGED IF

- 1) THEY LIE UPSTREAM FROM A SURCHARGED MANHOLE AND
- 2) ELEVATIONS OF TOP OF PIPE IN THE MANHOLE ARE LOWER THAN THE SURCHARGE ELEVATION IN THE DOWNSTREAM SURCHARGED MANHOLE.

SANITARY COLLECTION SYSTEM ANALYSIS AND DESIGN

-- INPUT DATA --

TRONA SEWER STUDY - ZONE 2

DATE: 09-25-1984

TIME: 11:56:06

LIMITING CONSTANTS

NO. OF MANHOLES = 24

NO. OF LAST MH. = 8

FLOW DESIGN CONSTANTS

SYSTEM PEAK FACTOR = 3

N VALUE VARIABLE WITH FLOW DEPTH

MINOR HEAD LOSS COEFFICIENT = 0

MANNING N FACTOR = .013

DESIGN CRITERIA

ANALYSIS ONLY OF SYSTEM

NOTE: INTERMEDIATE GROUND ELEVATIONS NOT INCLUDED

MANHOLE LINK DATA

LINK NO.	U.M. TITLE	D.M. NO.	PIPE DIA. in	LINK LENGTH ft	MANNING N	GROUND ELEV. ft	U.M. DEPTH ft	D.M. DEPTH ft	COST	DESIGN CRITERIA	LIFT STATION
1	MD-5	2	6.0	116.00	0.0130	1650.02	3.18	2.75	1100.0	4	N
2	MD-6	3	6.0	105.00	0.0130	1647.51	2.75	3.76	1100.0	4	N
3	MD-4	5	8.0	197.00	0.0130	1646.28	3.76	2.82	1100.0	4	N
4	MD-3	3	8.0	38.00	0.0130	1645.95	3.07	3.76	1100.0	4	N
5	MD-7	6	8.0	519.00	0.0130	1643.99	2.82	3.72	1100.0	4	N
6	MP-5	7	8.0	85.00	0.0130	1637.99	3.72	8.10	1100.0	4	N
7	MP-6	8	8.0	233.00	0.0130	1639.01	8.10	10.40	1100.0	4	N
8	M9	0	0.0	0.00	0.0130	1640.37	10.40	0.00	1100.0	4	N
9	MP-1	10	6.0	64.00	0.0130	1651.89	4.08	3.30	1100.0	4	N
10	MP-2	11	6.0	176.00	0.0130	1650.71	3.30	3.10	1100.0	4	N
11	MP-3	12	8.0	52.00	0.0130	1646.75	3.10	3.80	1100.0	4	N
12	MP-4	6	8.0	657.00	0.0130	1646.75	3.80	3.72	1100.0	4	N
13	MD-1	14	8.0	230.00	0.0130	1647.96	3.45	3.20	1100.0	4	N
14	MD-2	4	8.0	96.00	0.0130	1646.36	3.20	3.07	1100.0	4	N
15	MN-1	16	8.0	138.00	0.0130	1657.46	3.70	2.30	1100.0	4	N
16	MN-2	17	8.0	200.00	0.0130	1654.23	2.30	3.20	1100.0	4	N
17	MN-2A	18	8.0	65.00	0.0130	1651.44	3.20	2.20	1100.0	4	N
18	MN-3	19	8.0	225.00	0.0130	1649.92	2.20	6.95	1100.0	4	N
19	MN-4	20	8.0	325.00	0.0130	1645.42	6.95	7.30	1100.0	4	N
20	M2	21	8.0	223.00	0.0130	1644.43	7.30	8.70	1100.0	4	N
21	M3	22	8.0	317.00	0.0130	1644.90	8.70	6.20	1100.0	4	N
22	M4	23	8.0	349.00	0.0130	1641.10	6.20	6.20	1100.0	4	N
23	M5	24	8.0	334.00	0.0130	1639.65	6.20	5.70	1100.0	4	N
24	M6	7	8.0	286.00	0.0130	1637.79	5.70	8.10	1100.0	4	N

NODE SOLUTION ORDER

SOLUTION ORDER	U.M. NO.	D.M. NO.	TRIBUTARY	NODES
1	1	2	0	0
2	2	3	1	0
3	13	14	0	0
4	14	4	13	0
5	4	3	14	0
6	3	5	2	4
7	5	6	3	0

8	9	10	0	0	0
9	10	11	9	0	0
10	11	12	10	0	0
11	12	6	11	0	0
12	6	7	5	12	0
13	15	16	0	0	0
14	16	17	15	0	0
15	17	18	16	0	0
16	18	19	17	0	0
17	19	20	18	0	0
18	20	21	19	0	0
19	21	22	20	0	0
20	22	23	21	0	0
21	23	24	22	0	0
22	24	7	23	0	0
23	7	8	6	24	0

FLOW INPUT DATA

M.H. NO.	INPUT FLOW (cfs)	PEAK FACTOR
1	0.002	3.00
2	0.002	3.00
3	0.002	3.00
4	0.002	3.00
5	0.002	3.00
6	0.002	3.00
7	0.002	3.00
8	0.002	3.00
9	0.002	3.00
10	0.002	3.00
11	0.002	3.00
12	0.002	3.00
13	0.002	3.00
14	0.002	3.00
15	0.002	3.00
16	0.002	3.00
17	0.002	3.00
18	0.002	3.00
19	0.002	3.00
20	0.002	3.00
21	0.002	3.00
22	0.002	3.00
23	0.002	3.00
24	0.002	3.00

INFORMATION TO BE ENTERED INTO ANALYSIS

U.M.	D.M.	U.M.	D.M.	FLOW	ACCUM.	PEAK	U.M.	D.M.
TITLE	TITLE	NO.	NO.	INTO MH.	FLOW	FLOW	DEPTH	DEPTH
				cfs	cfs	cfs	ft	ft
MO-5	MO-6	1	2	0.002	0.002	0.006	3.18	2.75
MO-6	MO-4	2	3	0.002	0.004	0.013	2.75	3.76
MO-4	MO-7	3	5	0.002	0.013	0.039	3.76	2.82
MO-3	MO-4	4	3	0.002	0.006	0.019	3.07	3.76
MO-7	MP-5	5	6	0.002	0.015	0.045	2.82	3.72
MP-5	MP-6	6	7	0.002	0.026	0.077	3.72	8.10
MP-6	MP-9	7	8	0.002	0.049	0.148	8.10	10.40
MP-1	MP-2	9	10	0.002	0.002	0.006	4.08	3.30
MP-2	MP-3	10	11	0.002	0.004	0.013	3.30	3.10
MP-3	MP-4	11	12	0.002	0.006	0.019	3.10	3.80
MP-4	MP-5	12	6	0.002	0.009	0.026	3.80	3.72
MO-1	MO-2	13	14	0.002	0.002	0.006	3.45	3.20

MO-2	MO-3	14	4	0.002	0.004	0.013	3.20	3.07
MN-1	MN-2	15	16	0.002	0.002	0.006	3.70	2.30
MN-2	MN-2A	16	17	0.002	0.004	0.013	2.30	3.20
MN-2A	MN-3	17	18	0.002	0.006	0.019	3.20	2.20
MN-3	MN-4	18	19	0.002	0.009	0.026	2.20	6.95
MN-4	M2	19	20	0.002	0.011	0.032	6.95	7.30
M2	M3	20	21	0.002	0.013	0.039	7.30	8.70
M3	M4	21	22	0.002	0.015	0.045	8.70	6.20
M4	M5	22	23	0.002	0.017	0.051	6.20	6.20
M5	M6	23	24	0.002	0.019	0.058	6.20	5.70
M6	MP-6	24	7	0.002	0.021	0.064	5.70	8.10

PIPE SET DATA

COST DATA

EXCAVATION COST DATA

ITEM NO.	EXCAVATION LIMITS	UNIT PRICE
	ft ft	/lin ft

BACKFILL COST MULTIPLIERS

BEDDING COST DATA

CLASS C BEDDING INCLUDED IN EXCAVATION COST
 CLASS B BEDDING AT AN ADDITIONAL COST OF 0.00 PER LINEAR FOOT

PIPE COST DATA

ITEM NO.	PIPE SIZE	UNIT PRICE
	in	/lin ft

MANHOLE COST DATA

STANDARD MANHOLE: 0.00 TO 0.00 ft DEEP WITH A MAXIMUM DROP OF
 0.00 ft AT A UNIT PRICE OF 0.00 EACH.
 ADDITIONAL MANHOLE DEPTH AT A UNIT PRICE OF
 0.00 PER LINEAR FOOT.
 DROP OVER 0.00 ft THRU M.H. AT A UNIT PRICE OF
 0.00 PER LINEAR FOOT.

STREET REPAIR COST DATA

SANITARY COLLECTION SYSTEM ANALYSIS AND DESIGN

TRONA SEWER STUDY - ZONE 2

-- SOLUTION --

DATE: 09-25-1984

ITERATION # 1

PAGE: 1

LINK DATA				ELEVATION DATA				FLOW ANALYSIS			
UM:	PIPE	LINK	LINK	UPSTREAM	MANHOLE	DOWNSTR.	MH.	PIPE	PEAK FLOW	CONDITION	INPUT FLOW
TITLE NO.	DIAM.	LENGTH	SLOPE	INVERT	INVERT	DEPTH	DEPTH	VEL.	DEPTH	VEL.	DEPTH
	in	ft		ft	ft	ft	ft	cfs	in	cfs	in
MO-5	1	116.00	+1.79	1650.02	1646.84	3.18	1644.76	2.75	0.75	3.83	0.01
MO-6	2	105.00	+2.13	1647.51	1644.76	2.75	1642.52	3.76	0.82	4.17	0.01
MO-4	3	197.00	+0.69	1646.28	1642.52	3.76	1641.17	2.82	1.00	2.87	0.04
MO-3	4	38.00	+0.95	1645.95	1642.88	3.07	1642.52	3.76	1.18	3.37	0.02
MO-7	5	519.00	+1.33	1643.99	1641.17	2.82	1634.27	3.72	1.39	3.99	0.05
MP-5	6	85.00	+3.95	1637.99	1634.27	3.72	1630.91	8.10	2.40	6.88	0.08
MP-6	7	233.00	+0.40	1639.01	1630.91	8.10	1629.97	10.40	0.77	2.20	0.15
MP-1	9	64.00	+0.63	1651.89	1647.81	4.08	1647.41	3.30	0.44	2.26	0.01
MP-2	10	176.00	+2.14	1650.71	1647.41	3.30	1643.65	3.10	0.82	4.18	0.01
MP-3	11	52.00	+1.35	1646.75	1643.65	3.10	1642.95	3.80	1.40	4.02	0.02
MP-4	12	657.00	+1.32	1646.75	1642.95	3.80	1634.27	3.72	1.39	3.98	0.03
MO-1	13	230.00	+0.59	1647.96	1644.51	3.45	1643.16	3.20	0.93	2.65	0.01
MO-2	14	96.00	+0.29	1646.36	1643.16	3.20	1642.88	3.07	0.65	1.87	0.01
MN-1	15	138.00	+1.33	1657.46	1653.76	3.70	1651.93	2.30	1.39	3.99	0.01
MN-2	16	200.00	+1.84	1654.23	1651.93	2.30	1648.24	3.20	1.08	4.70	0.01
MN-3	17	65.00	+0.80	1651.44	1648.24	3.20	1647.72	2.20	1.08	3.10	0.02
MN-4	18	225.00	+4.11	1649.92	1647.72	2.20	1638.47	6.95	2.45	7.02	0.03
M2	19	325.00	+0.41	1645.42	1638.47	6.95	1637.13	7.30	0.78	2.22	0.03
M3	20	223.00	+0.42	1644.43	1637.13	7.30	1636.20	8.70	0.78	2.24	0.04
M4	21	317.00	+0.41	1644.90	1636.20	8.70	1634.90	6.20	0.77	2.22	0.05
M5	22	349.00	+0.42	1641.10	1634.90	6.20	1633.45	6.20	0.78	2.23	0.05
M6	23	334.00	+0.41	1639.65	1633.45	6.20	1632.09	5.70	0.77	2.21	0.06
	24	286.00	+0.41	1637.79	1632.09	5.70	1630.91	8.10	0.78	2.22	0.06

NOT FOR BID

WILSON F. SO & ASSOCIATES, INC.
APPLE VALLEY, CALIFORNIA

COST ESTIMATE FOR CONSTRUCTING 1.00 LF OF 8 IN. DIA. SEWER PIPE (PVC)

VOLUME OF EXCAVATION .74CY/LF
AVERAGE DEPTH OF COVER (ft) = 6

SUMMARY OF COSTS

A.	EXCAVATION	@ \$ 2.50/CY	\$	1.85
B.	BACKFILL & COMPACTION	@ \$ 3.00/CY	\$	2.19
C.	PIPE MATERIAL	@ \$ 2.60/LF	\$	2.60
D.	SHORING	@ \$.22/SF	\$	2.95
E.	PIPE LAYING	@ \$.22/LF-IN	\$	1.76
F.	FINAL CLEANING	@ \$ 1.00/LF	\$	1.00
G.	TRENCH PAVEMENT, 2.5 IN AC (100%)	@ \$ 1.50/SF	\$	5.00
H.	AC CURBING	(100%) @ \$.30/SF-IN	\$	2.00
I.	SITE ADJUSTMENT	(15%)	\$	3.10

SUBTOTAL: \$ 23.73

15% PROFIT AND CONTINGENCY: \$ 3.56

NOV. 1984 ENR INDEX = 5500

TOTAL: \$ 27.29

MAY 1985 ENR INDEX = 5720

TOTAL: \$ 28.38

WILSON F. SO & ASSOCIATES, INC.
APPLE VALLEY, CALIFORNIA

COST ESTIMATE FOR CONSTRUCTING

1.00 LF OF 10 IN. DIA. SEWER PIPE (PVC)

VOLUME OF EXCAVATION .76CY/LF
AVERAGE DEPTH OF COVER (ft) = 6

SUMMARY OF COSTS

A.	EXCAVATION	@ \$ 2.30/CY	\$	1.90
B.	BACKFILL & COMPACTION	@ \$ 3.00/CY	\$	2.21
C.	PIPE MATERIAL	@ \$ 3.50/LF	\$	5.25
D.	SHORING	@ \$.22/SF	\$	3.03
E.	PIPE LAYING	@ \$.22/LF-IN	\$	2.20
F.	FINAL CLEANING	@ \$ 1.00/LF	\$	1.00
G.	TRENCH PAVEMENT, 2.5 IN AC (100%)	@ \$ 1.50/SF	\$	5.00
H.	AC CURBING	(100%) @ \$.30/SF-IN	\$	2.00
I.	SITE ADJUSTMENT	(15%)	\$	3.39

SUBTOTAL: \$ 25.98

15% PROFIT AND CONTINGENCY: \$ 3.90

NOV. 1984 ENR INDEX = 5500

TOTAL: \$ 29.88

MAY 1985 ENR INDEX = 5720

TOTAL: \$ 31.07

WILSON F. SO & ASSOCIATES, INC.
APPLE VALLEY, CALIFORNIA

COST ESTIMATE FOR CONSTRUCTING

1.00 LF OF 12 IN. DIA. SEWER PIPE (PVC)

VOLUME OF EXCAVATION .79CY/LF
AVERAGE DEPTH OF COVER (ft) = 6

SUMMARY OF COSTS

A.	EXCAVATION	@ \$ 2.50/CY	\$	1.98
B.	BACKFILL & COMPACTION	@ \$ 3.00/CY	\$	2.28
C.	PIPE MATERIAL	@ \$ 4.41/LF	\$	6.62
D.	SHORING	@ \$.22/SF	\$	3.10
E.	PIPE LAYING	@ \$.22/LF-IN	\$	2.64
F.	FINAL CLEANING	@ \$ 1.00/LF	\$	1.00
G.	TRENCH PAVEMENT, 2.5IN AC (100%)	@ \$ 1.50/SF	\$	5.06
H.	AC CURBING	(100%) @ \$.30/SF-IN	\$	2.01
I.	SITE ADJUSTMENT	(15%)	\$	3.70

SUBTOTAL: \$ 28.38

15% PROFIT AND CONTINGENCY: \$ 4.26

NOV. 1984 ENR INDEX = 5500

TOTAL: \$ 32.63

MAY 1985 ENR INDEX = 5720

TOTAL: \$ 33.94

WILSON F. SO & ASSOCIATES, INC.
APPLE VALLEY, CALIFORNIA

COST ESTIMATE FOR CONSTRUCTING

1.00 LF OF 15 IN. DIA. SEWER PIPE (PVC)

VOLUME OF EXCAVATION .89CY/LF
AVERAGE DEPTH OF COVER (ft) = 6

SUMMARY OF COSTS

A.	EXCAVATION	@ \$ 2.50/CY	\$	2.20
B.	BACKFILL & COMPACTION	@ \$ 3.00/CY	\$	2.50
C.	PIPE MATERIAL	@ \$ 6.53/LF	\$	9.80
D.	SHORING	@ \$.22/SF	\$	3.20
E.	PIPE LAYING	@ \$.22/LF-IN	\$	3.30
F.	FINAL CLEANING	@ \$ 1.00/LF	\$	1.00
G.	TRENCH PAVEMENT, 2.5 IN AC (100%)	@ \$ 1.50/SF	\$	5.42
H.	AC CURBING	(100%) @ \$.30/SF-IN	\$	2.08
I.	SITE ADJUSTMENT	(15%)	\$	4.43

SUBTOTAL: \$ 33.93

15% PROFIT AND CONTINGENCY: \$ 5.09

NOV. 1984 ENR INDEX = 5500

TOTAL: \$ 39.01

MAY 1985 ENR INDEX = 5720

TOTAL: \$ 40.57

ATTACHMENT 6 – HYDRAULIC CALCULATIONS

BENTLEY FLOWMASTER RESULTS

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Slope needed for 2 fps 64 gpm

Project Description	
Friction Method	Manning
Solve For	Formula Normal Depth
Input Data	
Roughness Coefficient	0.010
Channel Slope	0.450 %
Diameter	12.0 in
Discharge	64.00 gpm
Results	
Normal Depth	1.8 in
Flow Area	0.1 ft ²
Wetted Perimeter	0.8 ft
Hydraulic Radius	1.1 in
Top Width	0.71 ft
Critical Depth	1.9 in
Percent Full	14.6 %
Critical Slope	0.357 %
Velocity	2.01 ft/s
Velocity Head	0.06 ft
Specific Energy	0.21 ft
Froude Number	1.118
Maximum Discharge	1,500.01 gpm
Discharge Full	1,394.44 gpm
Slope Full	0.001 %
Flow Type	Supercritical
GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0
GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Average End Depth Over Rise	0.0 %
Normal Depth Over Rise	14.6 %
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	1.8 in
Critical Depth	1.9 in
Channel Slope	0.450 %
Critical Slope	0.357 %

12-inch PVC at 0.35% slope, 64 gpm

Project Description	
Friction Method	Manning
	Formula
Solve For	Normal Depth
Input Data	
Roughness Coefficient	0.010
Channel Slope	0.350 %
Diameter	12.0 in
Discharge	64.00 gpm
Results	
Normal Depth	1.9 in
Flow Area	0.1 ft ²
Wetted Perimeter	0.8 ft
Hydraulic Radius	1.1 in
Top Width	0.72 ft
Critical Depth	1.9 in
Percent Full	15.5 %
Critical Slope	0.354 %
Velocity	1.84 ft/s
Velocity Head	0.05 ft
Specific Energy	0.21 ft
Froude Number	0.991
Maximum Discharge	1,322.89 gpm
Discharge Full	1,229.78 gpm
Slope Full	0.001 %
Flow Type	Subcritical
GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0
GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Average End Depth Over Rise	0.0 %
Normal Depth Over Rise	14.6 %
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	1.9 in
Critical Depth	1.9 in
Channel Slope	0.350 %
Critical Slope	0.354 %

Worksheet for 0.21 MGD from Pioneer Point min slope to achieve 2 fps

Project Description	
Friction Method	Manning
Solve For	Formula
	Normal Depth
Input Data	
Roughness Coefficient	0.010
Channel Slope	0.230 %
Diameter	12.0 in
Discharge	0.21 MGD
Results	
Normal Depth	3.1 in
Flow Area	0.2 ft ²
Wetted Perimeter	1.1 ft
Hydraulic Radius	1.8 in
Top Width	0.88 ft
Critical Depth	2.8 in
Percent Full	25.8 %
Critical Slope	0.335 %
Velocity	2.02 ft/s
Velocity Head	0.06 ft
Specific Energy	0.32 ft
Froude Number	0.830
Maximum Discharge	1.54 MGD
Discharge Full	1.44 MGD
Slope Full	0.005 %
Flow Type	Subcritical
GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0
GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Average End Depth Over Rise	0.0 %
Normal Depth Over Rise	34.9 %
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	3.1 in
Critical Depth	2.8 in
Channel Slope	0.230 %
Critical Slope	0.335 %

Worksheet for 0.16 MGD from Trona min slope to achieve 2 fps

Project Description	
Friction Method	Manning
	Formula
Solve For	Normal Depth
Input Data	
Roughness Coefficient	0.010
Channel Slope	0.280 %
Diameter	12.0 in
Discharge	0.16 MGD
Results	
Normal Depth	2.6 in
Flow Area	0.1 ft ²
Wetted Perimeter	1.0 ft
Hydraulic Radius	1.5 in
Top Width	0.82 ft
Critical Depth	2.5 in
Percent Full	21.5 %
Critical Slope	0.340 %
Velocity	2.00 ft/s
Velocity Head	0.06 ft
Specific Energy	0.28 ft
Froude Number	0.909
Maximum Discharge	1.70 MGD
Discharge Full	1.58 MGD
Slope Full	0.003 %
Flow Type	Subcritical
GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0
GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Average End Depth Over Rise	0.0 %
Normal Depth Over Rise	34.9 %
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	2.6 in
Critical Depth	2.5 in
Channel Slope	0.280 %
Critical Slope	0.340 %

Worksheet for 0.03% slope, 64 gpm

Project Description	
Friction Method	Manning
Solve For	Formula
	Normal Depth
Input Data	
Roughness Coefficient	0.010
Channel Slope	0.030 %
Diameter	12.0 in
Discharge	64.00 gpm
Results	
Normal Depth	3.4 in
Flow Area	0.2 ft ²
Wetted Perimeter	1.1 ft
Hydraulic Radius	2.0 in
Top Width	0.90 ft
Critical Depth	1.9 in
Percent Full	28.5 %
Critical Slope	0.354 %
Velocity	0.77 ft/s
Velocity Head	0.01 ft
Specific Energy	0.29 ft
Froude Number	0.301
Maximum Discharge	387.30 gpm
Discharge Full	360.04 gpm
Slope Full	0.001 %
Flow Type	Subcritical
GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0
GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Average End Depth Over Rise	0.0 %
Normal Depth Over Rise	14.6 %
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	3.4 in
Critical Depth	1.9 in
Channel Slope	0.030 %
Critical Slope	0.354 %