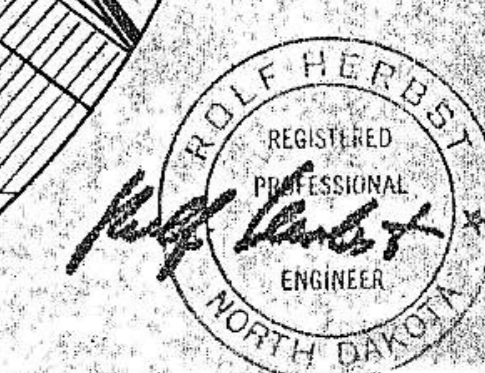
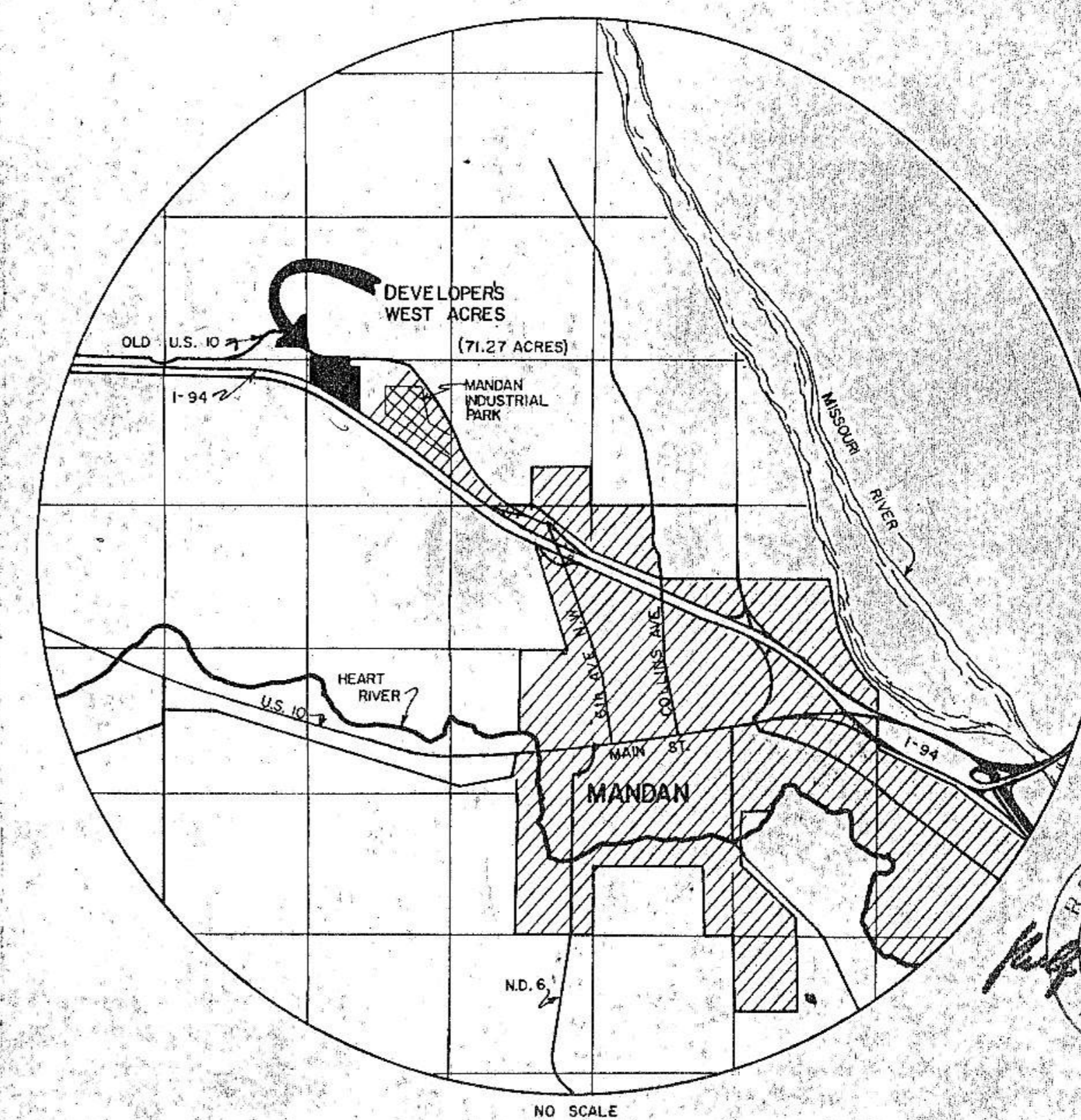


# CONSOLIDATED WATER AND SEWER IMPROVEMENT DIST. NO. 24 CITY OF MANDAN, NORTH DAKOTA

## INDEX

SHEET NO.	TITLE SHEET
1.	-PROJECT LAYOUT-
2.	WALKER DRIVE (EASEMENT)
3.	WALKER DRIVE
4.	WALKER DRIVE
	TRITE AVENUE
	TAMARA AVENUE
5.	SCOTT AVENUE
	MICHEALA AVENUE
6.	KEMBERLY AVENUE
	BRANDON AVENUE
7.	GHEN AVENUE
	CAMERON STREET
8.	CAMERON STREET
9.	DEAN'S DRIVE
10.	LIFT STATION DETAILS
11.	MANHOLE DETAILS
12.	WATERMAIN DETAILS

LOCATION MAP



TOMAN ENGINEERING CO.

OCTOBER 1976

CONSULTING ENGINEERS

5

D 24  
Copy C

# DEVELOPER'S WEST ACRES WATER & SEWER DISTRICT NO. 24 PROJECT LAYOUT

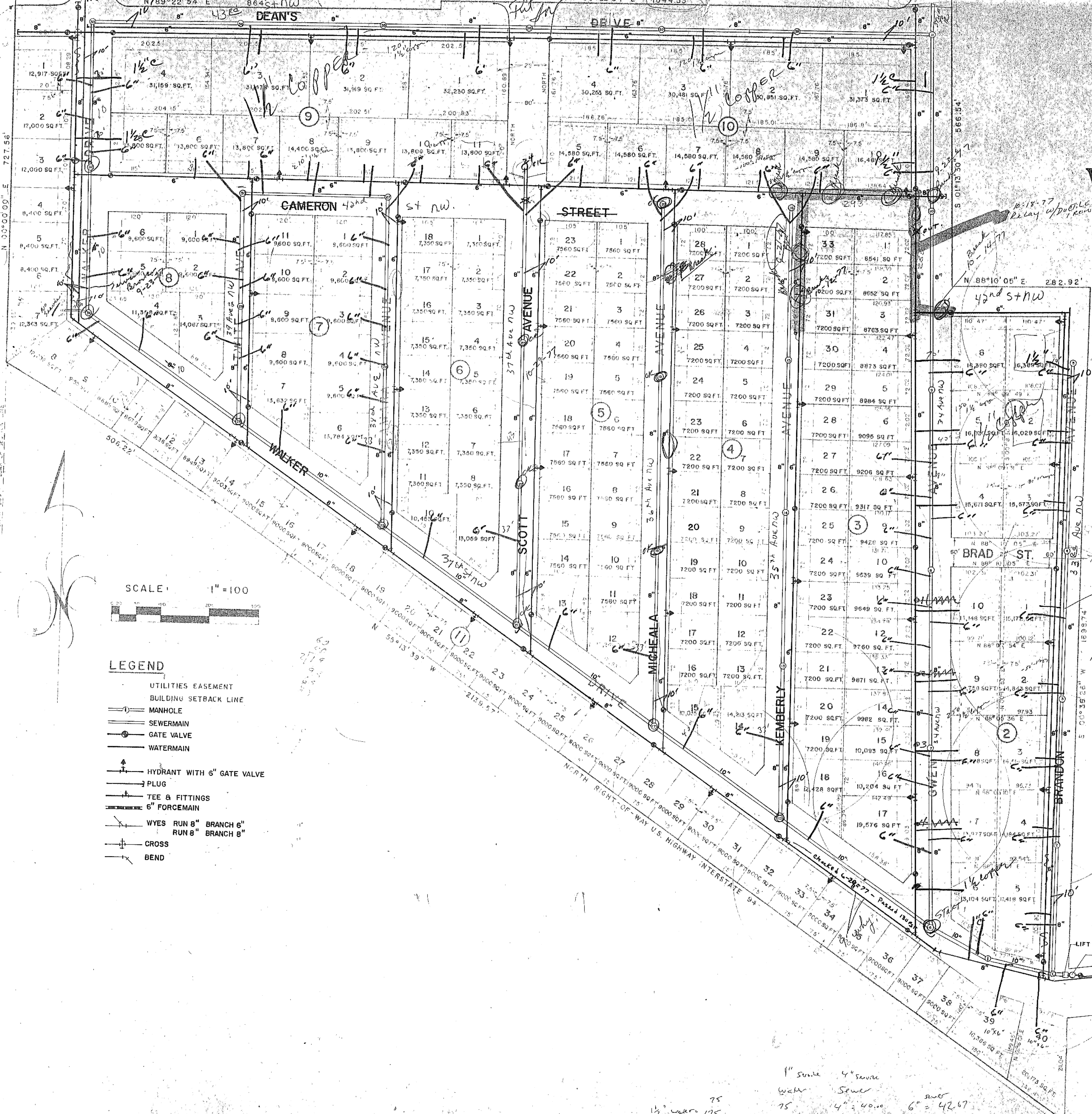
- 37 - 1/2" copper service.
- 45 - 1" corp / ~~1" corp~~ Abandoned.
- 3 - 1" copper service Abandoned.

TOTAL 4/6  
 78 - 6" service Pipe } 17 - 10" x 6" wyes.  
 61 - 8" x 6" wyes.  
 33 - 10" x 4" wyes.  
 85 - 8" x 4" wyes  
 196 UNITS.

SCALE: 1" = 100'

### LEGEND

- UTILITIES EASEMENT
- BUILDING SETBACK LINE
- MANHOLE
- SEWERMAIN
- GATE VALVE
- WATERMAIN
- HYDRANT WITH 6" GATE VALVE
- PLUG
- TEE & FITTINGS
- 6" FORCEMAIN
- WYES RUN 8" BRANCH 6"  
RUN 8" BRANCH 8"
- CROSS
- BEND

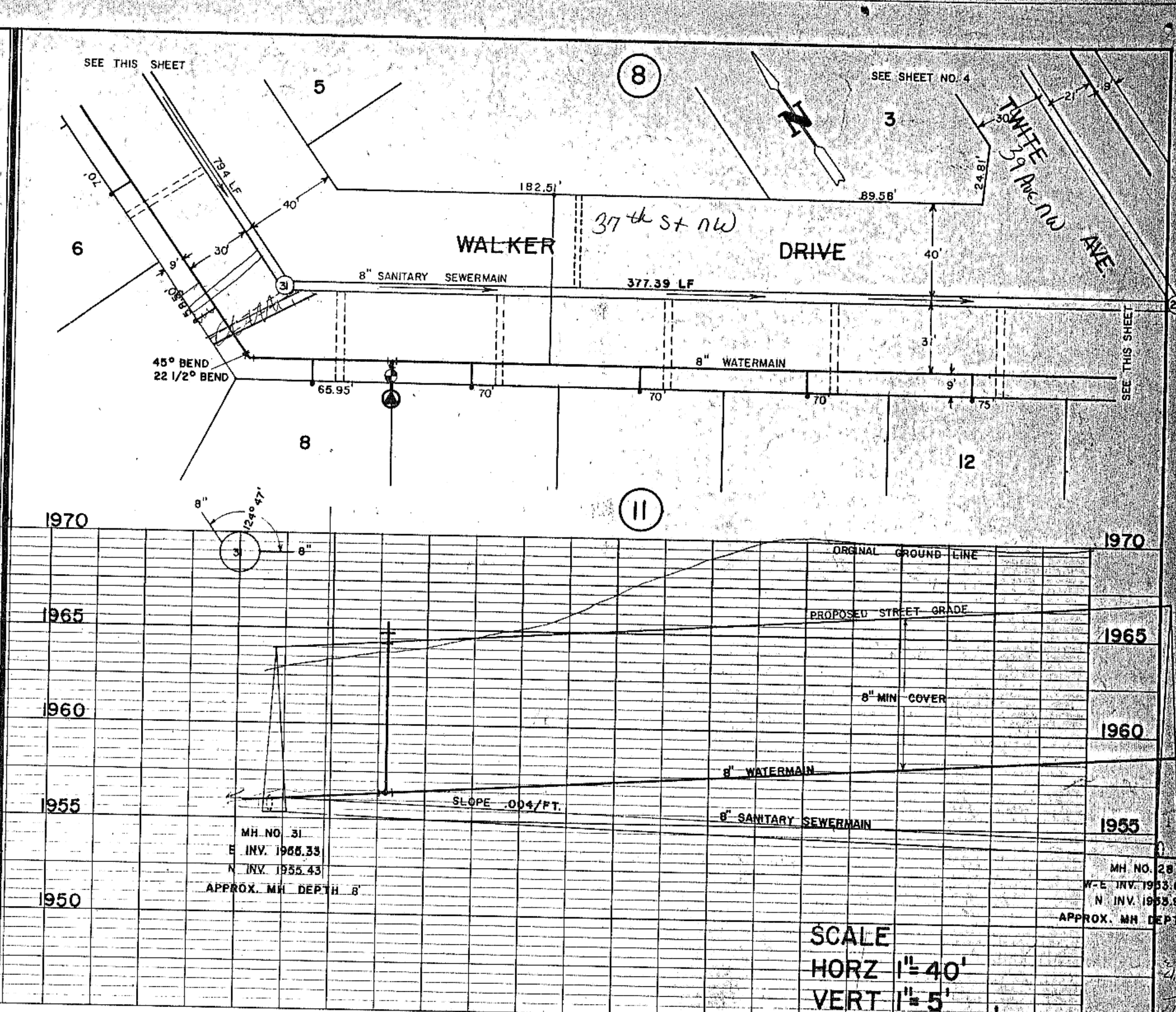
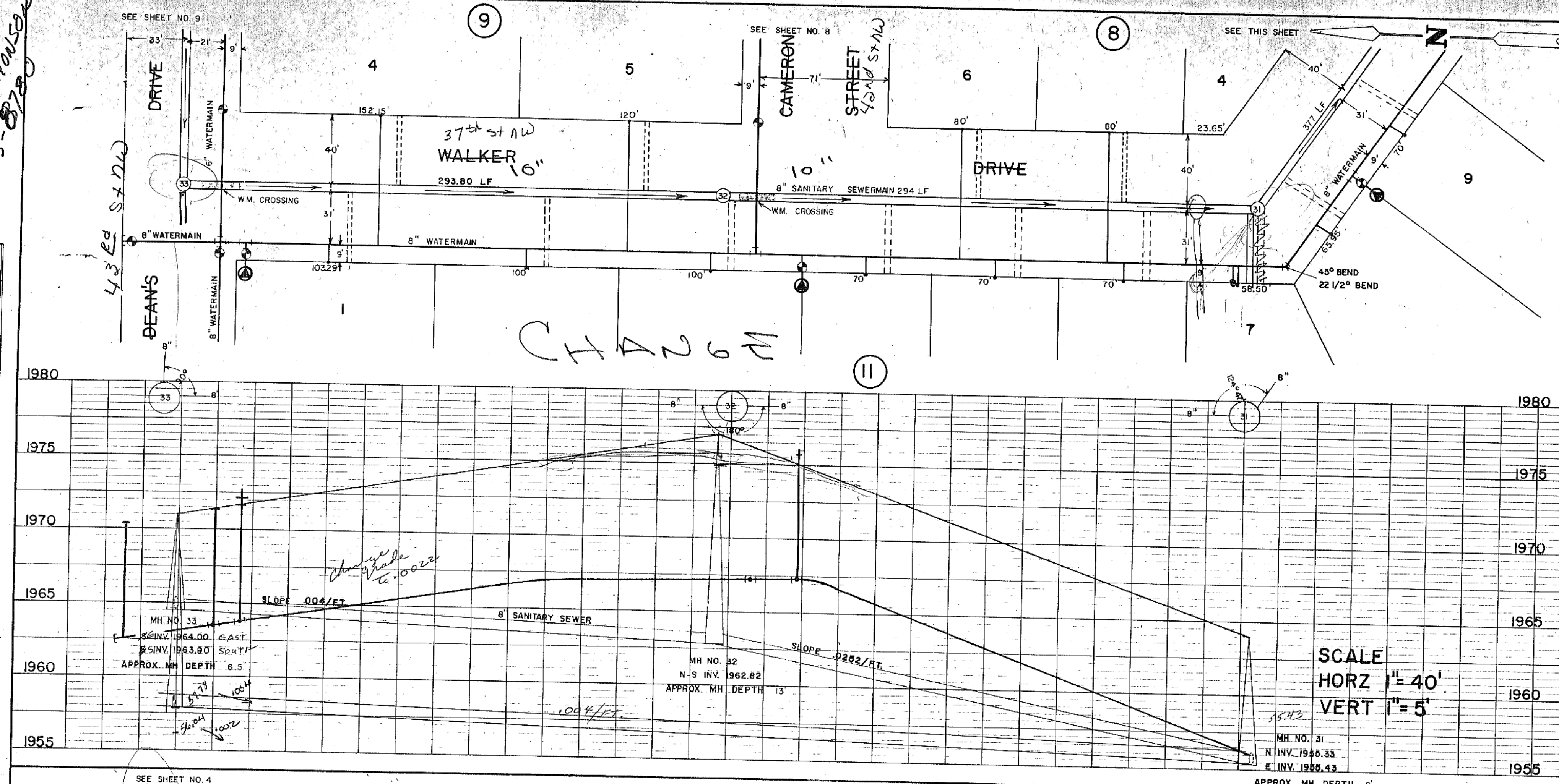


1" service 4" service  
 water sewer  
 75 4" = 40.00 6" = 42.67  
 1/2" water 175 4.00/ft 4.00/ft 4.25/ft

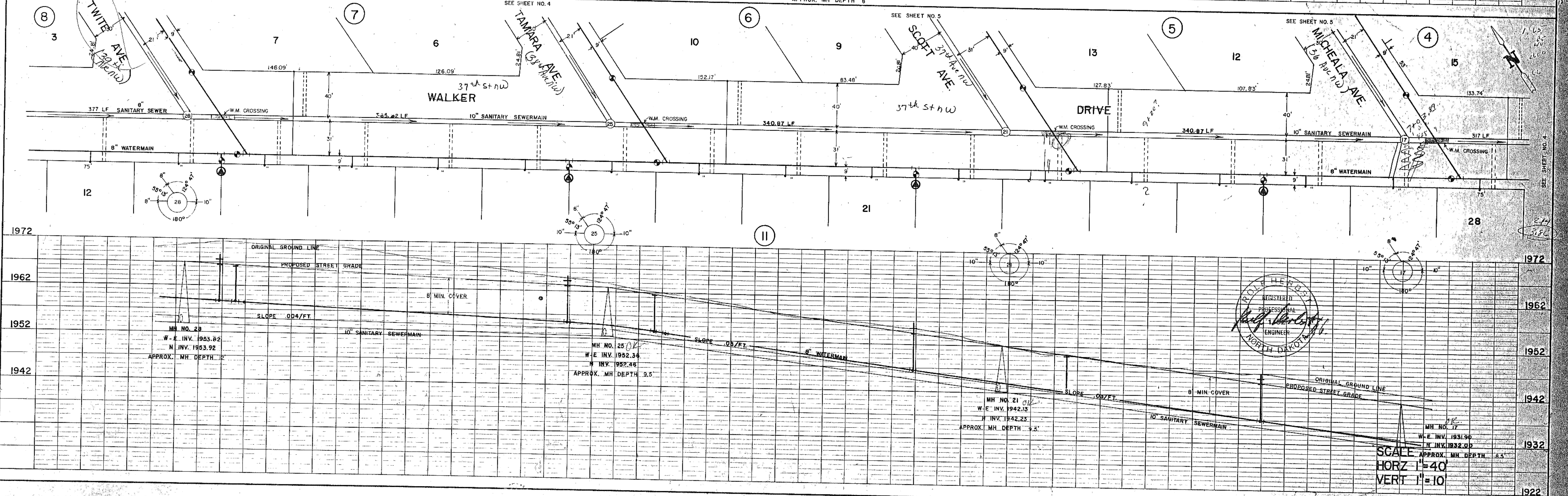
Toman Engineering Company  
 Civil & Environmental Consultants  
 P.O. Box 708 P.O. Box 852  
 Mandan, ND - Bismarck, Man RKO OEP

*DATE: 10/28/80*  
*BY: Dave Hanson*

PLAN	DATE
NO.	
BY	
REVISIONS	
NO.	
DATE	
BY	
REVISIONS	
NO.	
DATE	
BY	

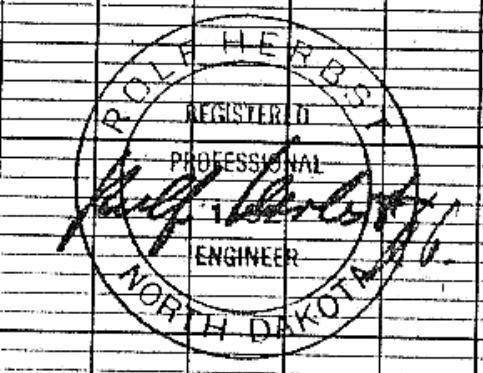


PROFILE	DATE
NO.	
BY	
REVISIONS	
NO.	
DATE	
BY	
REVISIONS	
NO.	
DATE	
BY	

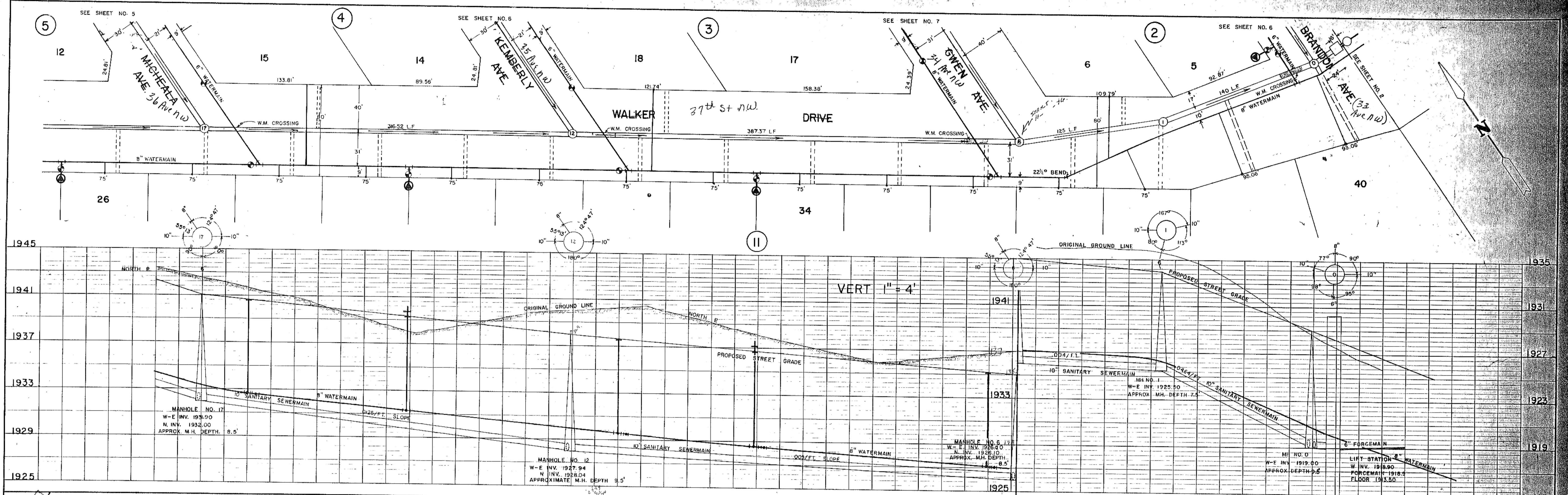


**K&E** PLATE 2, FLAT PLAN-PROFILE  
 KEUFFEL & ESSER CO.  
 48 7032, MADE IN U.S.A.

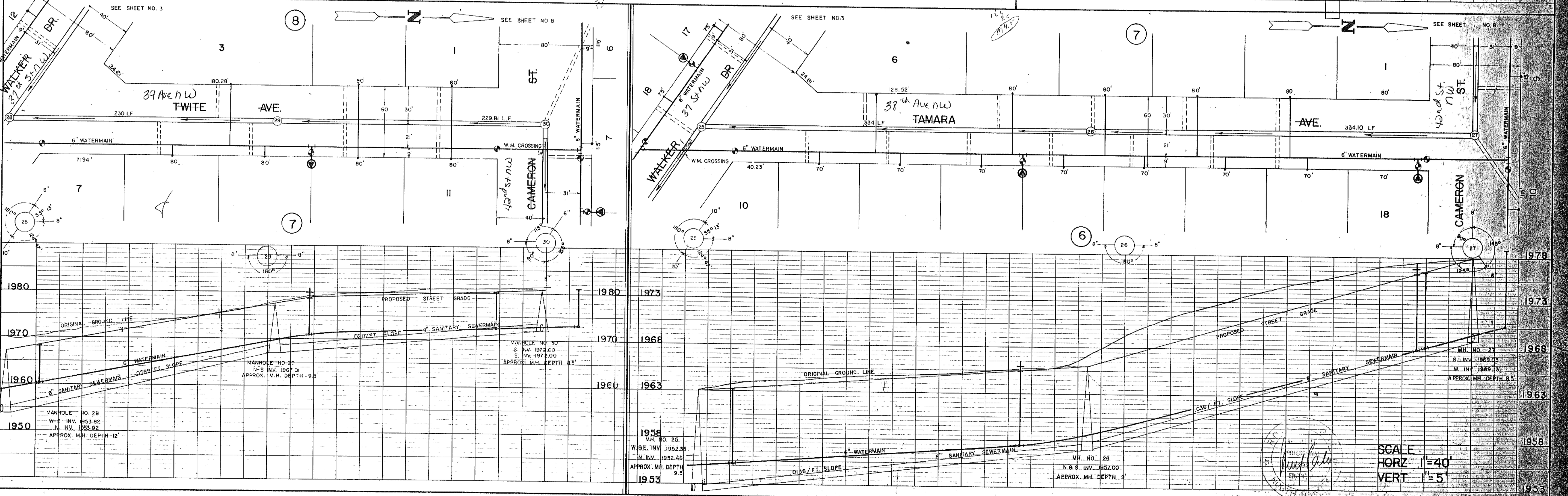
**Toman Engineering Company**  
 Civil & Environmental Consultants  
 P. O. Box 708 Mandan, N.D. 58542  
 SHEET NO. 3 OF 12 SHEETS



DATE: \_\_\_\_\_ BY: \_\_\_\_\_  
 SUPERVISOR: \_\_\_\_\_  
 PLAN NOTE BOOK NO. \_\_\_\_\_  
 ROUTE: \_\_\_\_\_  
 GRADES CHECKED: \_\_\_\_\_  
 E.L. OF MAIN CENTERLINE: \_\_\_\_\_

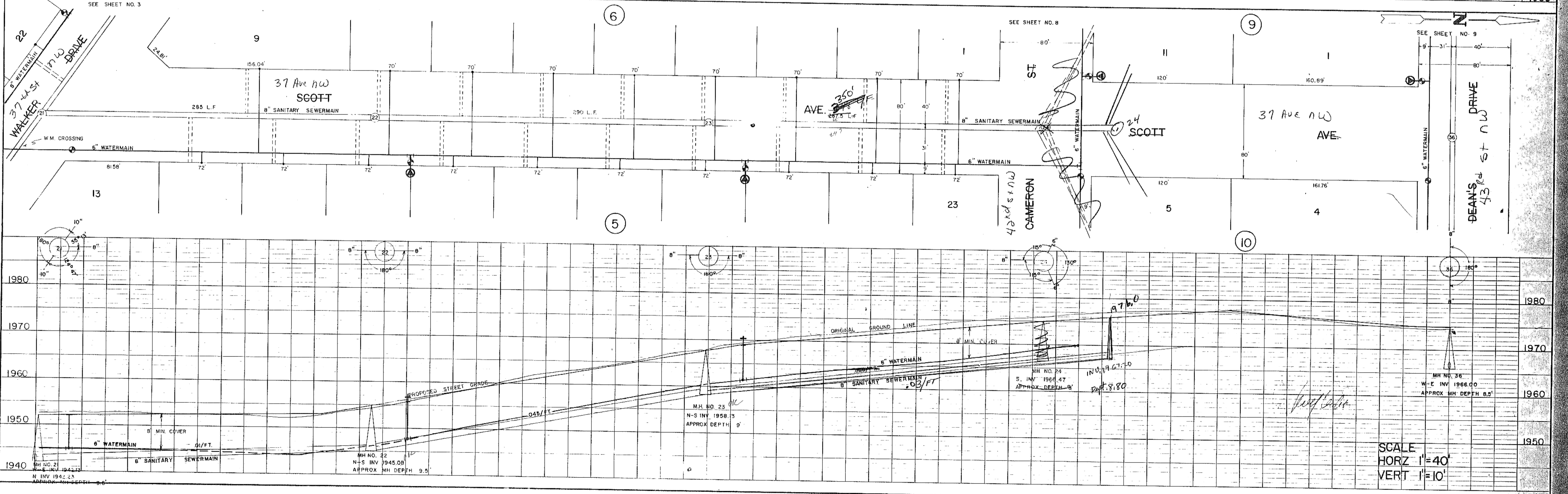
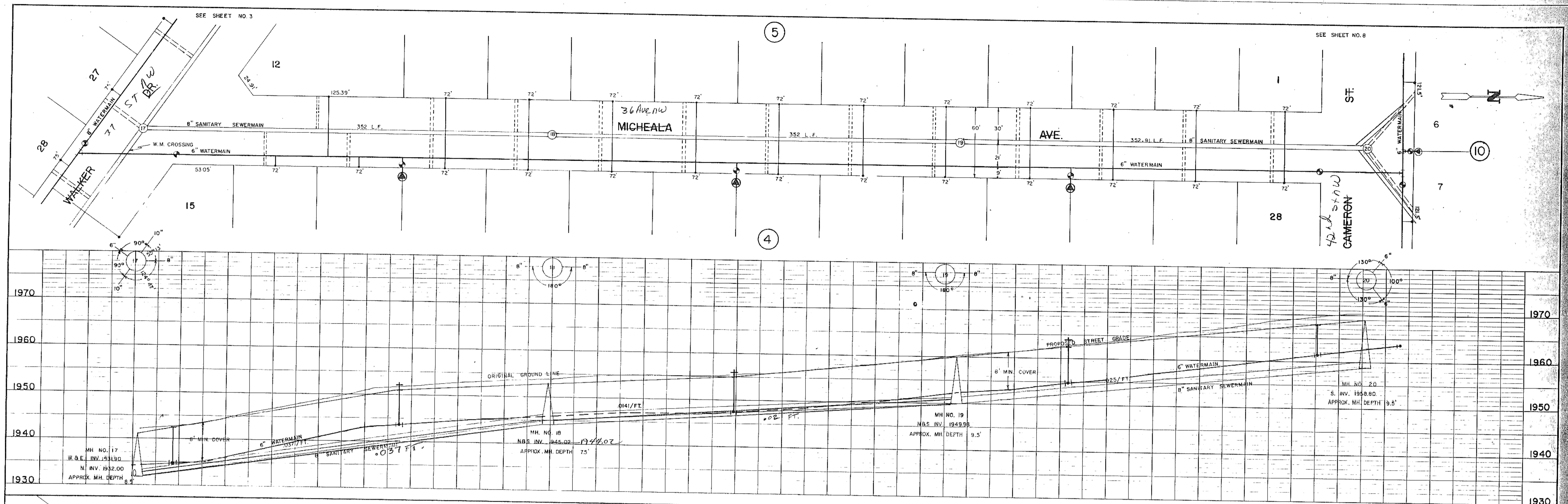


DATE: \_\_\_\_\_ BY: \_\_\_\_\_  
 SUPERVISOR: \_\_\_\_\_  
 PROFILE NOTE BOOK NO. \_\_\_\_\_  
 ROUTE: \_\_\_\_\_  
 GRADES CHECKED: \_\_\_\_\_  
 E.L. OF MAIN CENTERLINE: \_\_\_\_\_



**PLAN**  
 DRAWN BY: \_\_\_\_\_  
 CHECKED BY: \_\_\_\_\_  
 DATE: \_\_\_\_\_  
 NOTE BOOK NO. \_\_\_\_\_  
 ADJUSTMENT CHECKED BY: \_\_\_\_\_  
 AT: OF WAY CHECKED BY: \_\_\_\_\_

**PROFILE**  
 DRAWN BY: \_\_\_\_\_  
 CHECKED BY: \_\_\_\_\_  
 DATE: \_\_\_\_\_  
 NOTE BOOK NO. \_\_\_\_\_  
 ADJUSTMENT CHECKED BY: \_\_\_\_\_  
 AT: OF WAY CHECKED BY: \_\_\_\_\_



**K&E** PLATE 2, FLAT PLAN PROFILE  
 KEUFEL & ESSER CO.  
 48 7032 MADE IN U.S.A.

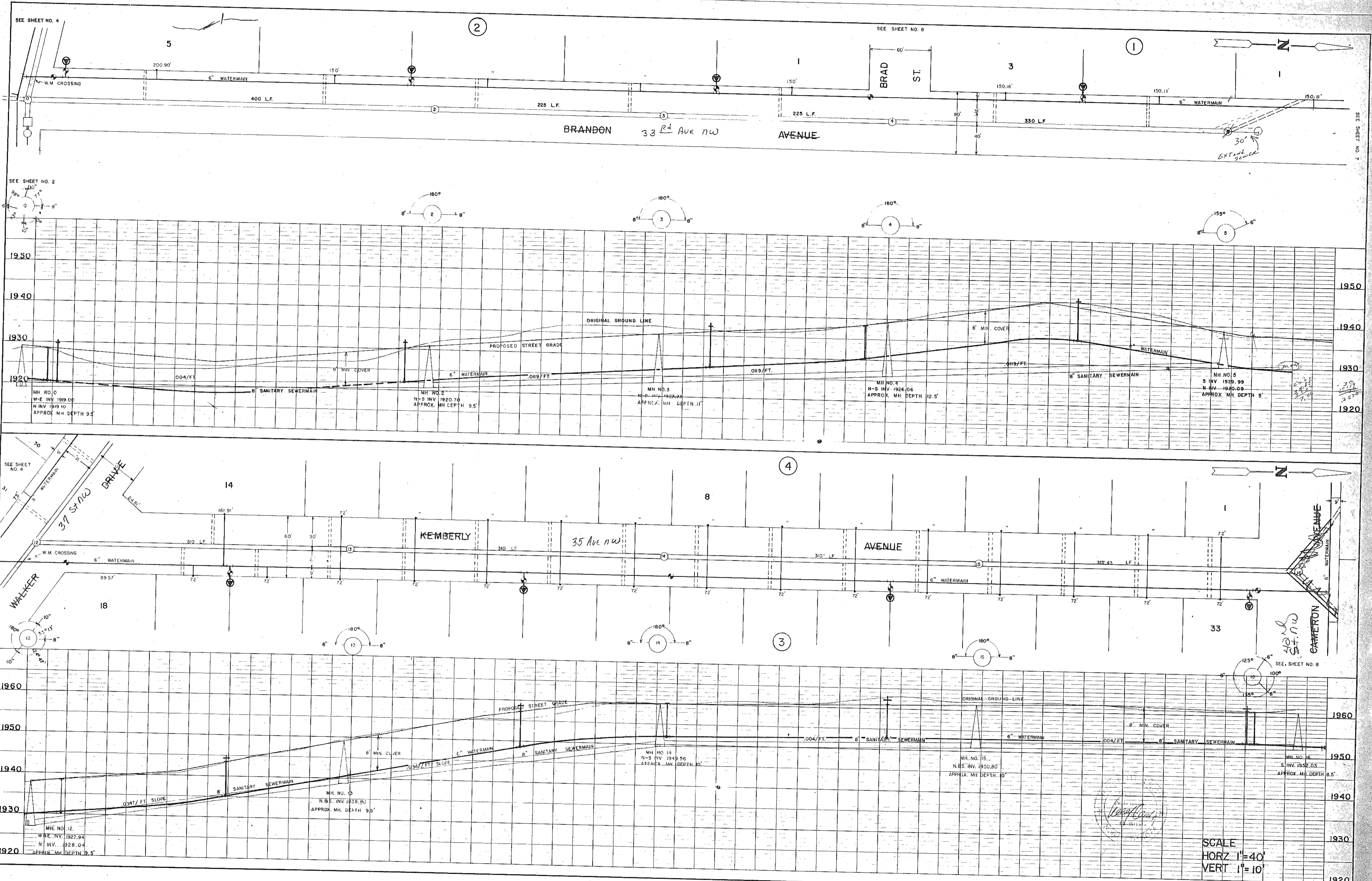
Toman Engineering Company  
 Civil & Environmental Consultants  
 P. O. Box 703, P. O. Box 832  
 Mandan, ND Boisevain, Man RKO OEO

SHEET NO. 5 OF 12 SHEETS

SCALE  
 HORIZ 1"=40'  
 VERT 1"=10'

DATE: \_\_\_\_\_ BY: \_\_\_\_\_  
 SURVEYED: \_\_\_\_\_ PLOTTED: \_\_\_\_\_  
 CHECKED: \_\_\_\_\_  
 PLAN NOTE BOOK No. \_\_\_\_\_

DATE: \_\_\_\_\_ BY: \_\_\_\_\_  
 SURVEYED: \_\_\_\_\_ PLOTTED: \_\_\_\_\_  
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 PROFILE NOTE BOOK No. \_\_\_\_\_



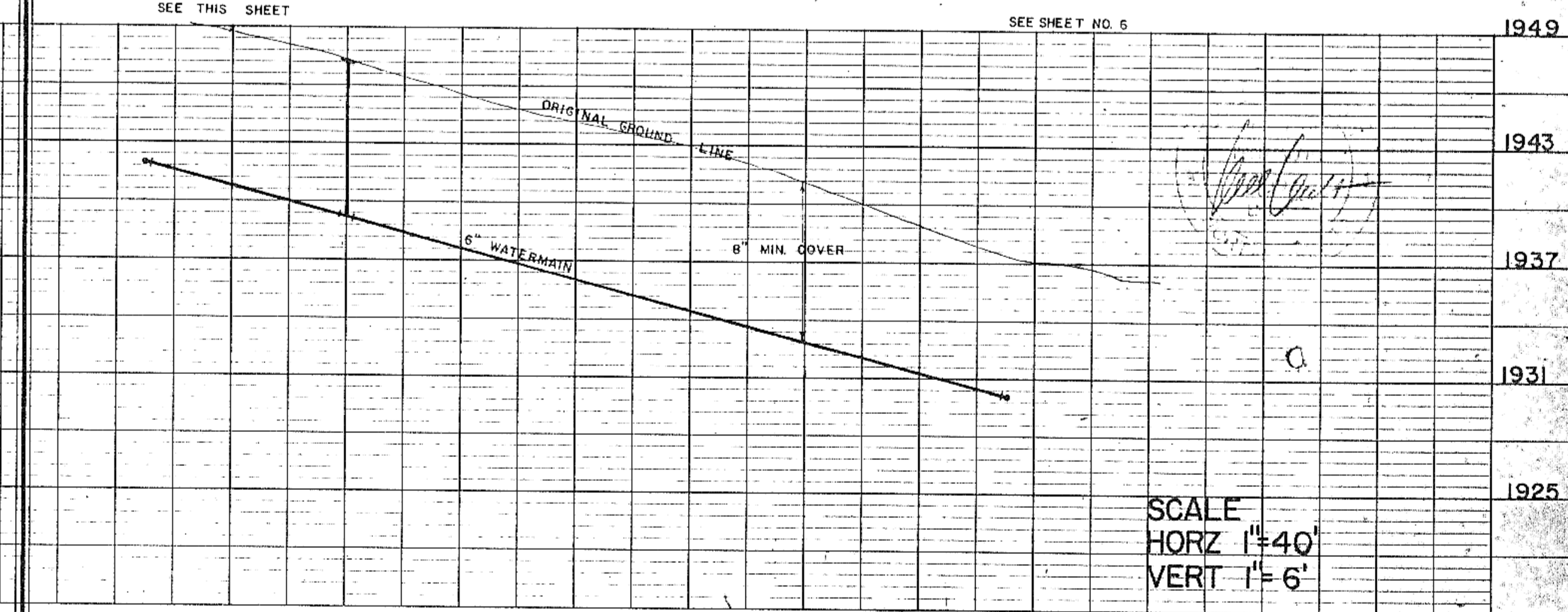
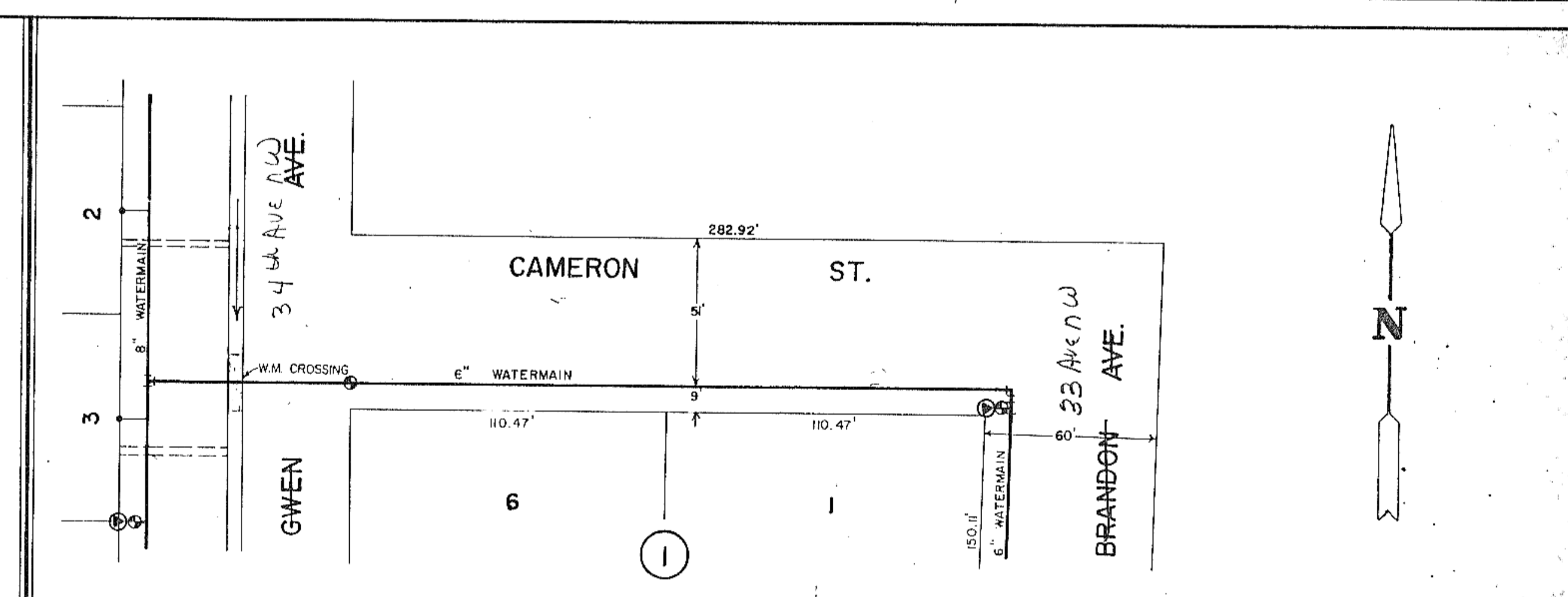
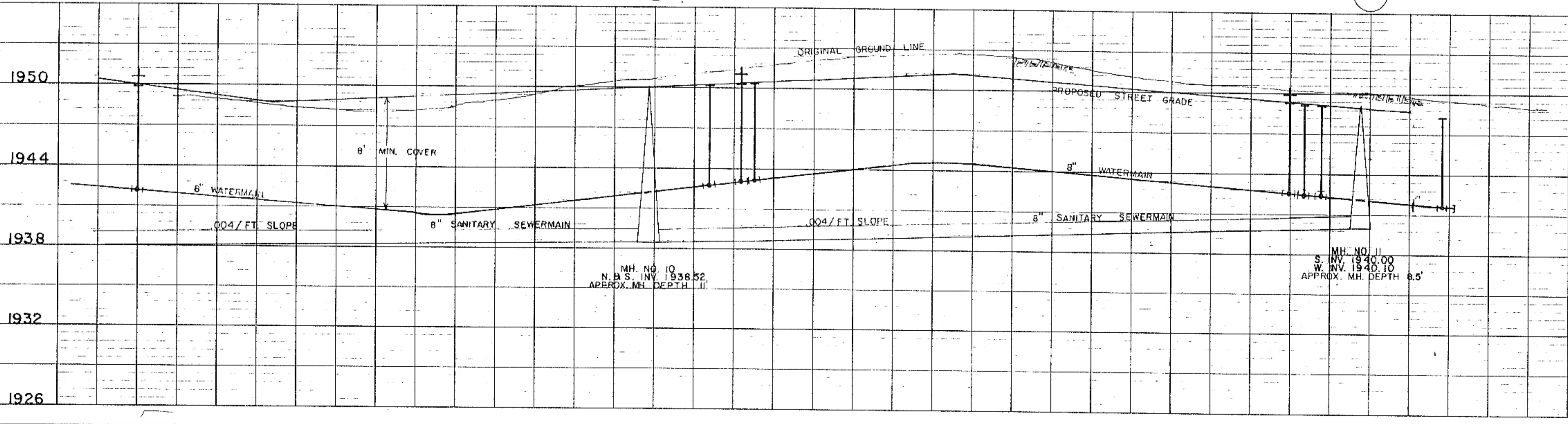
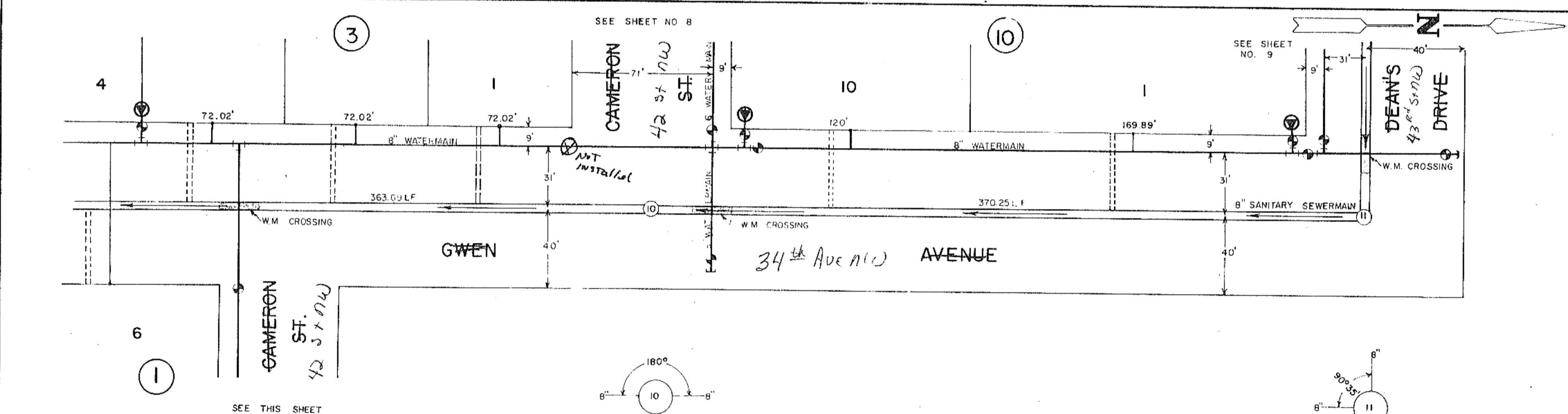
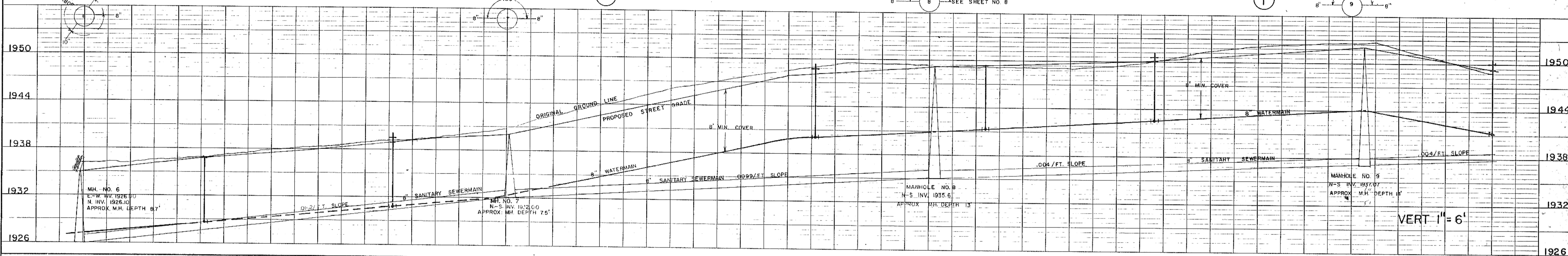
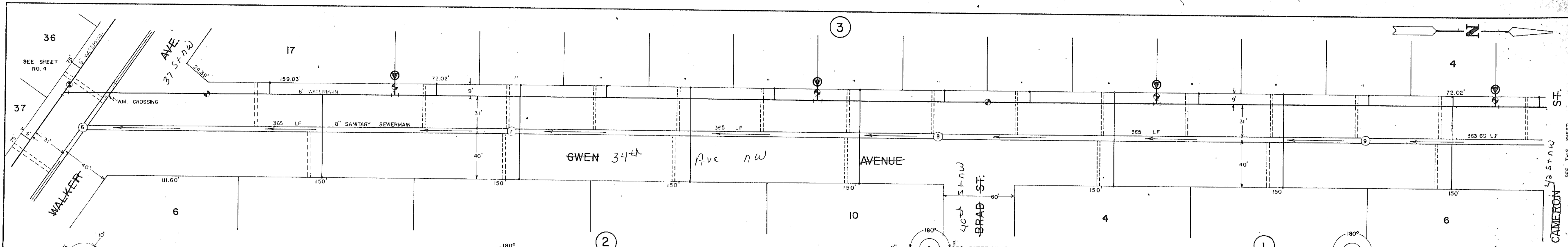
K&E PLATE 2, FLAT PLAN-PROFILE  
 KEUFFEL & ESSER CO.  
 48 7032 MADE IN U.S.A.

Toman Engineering Company  
 Civil & Environmental Consultants  
 P. O. Box 708 - P. O. Box 852  
 Mandan, ND - Bismarck, ND RKO OEO  
 SHEET NO. 6 OF 12 SHEETS

SCALE  
 HORIZ 1"=40'  
 VERT 1"=10'

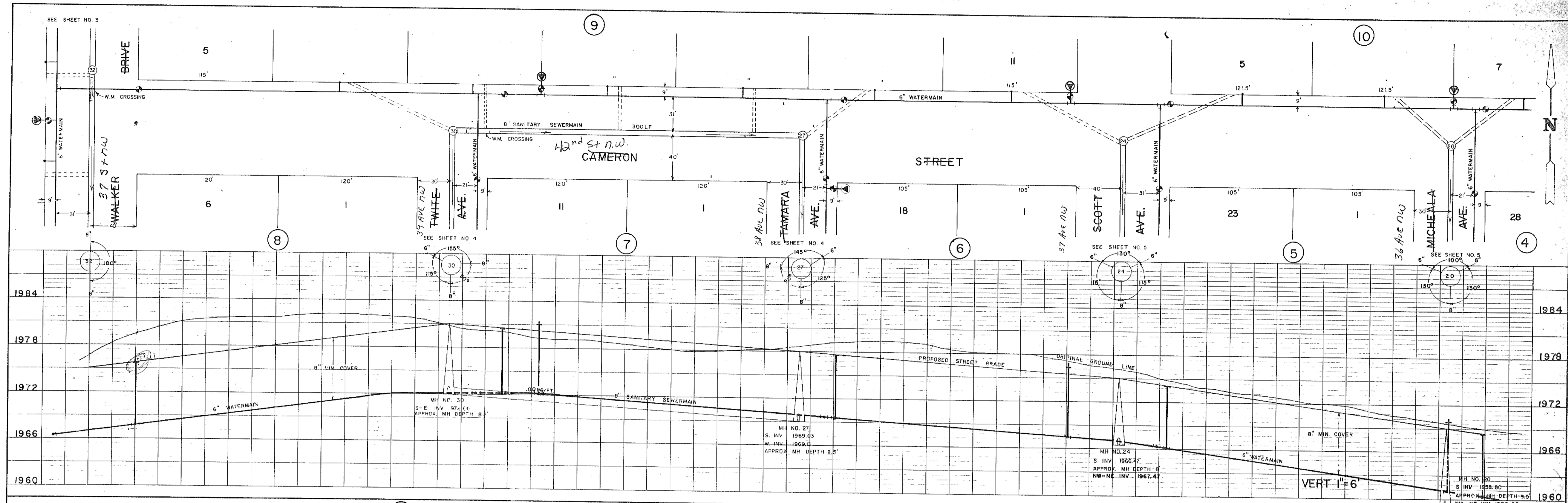
DATE: \_\_\_\_\_  
 BY: \_\_\_\_\_  
 SUPERVISED: \_\_\_\_\_  
 CHECKED: \_\_\_\_\_  
 DATE: \_\_\_\_\_  
 BY: \_\_\_\_\_  
 SUPERVISED: \_\_\_\_\_  
 CHECKED: \_\_\_\_\_

DATE: \_\_\_\_\_  
 BY: \_\_\_\_\_  
 SUPERVISED: \_\_\_\_\_  
 CHECKED: \_\_\_\_\_

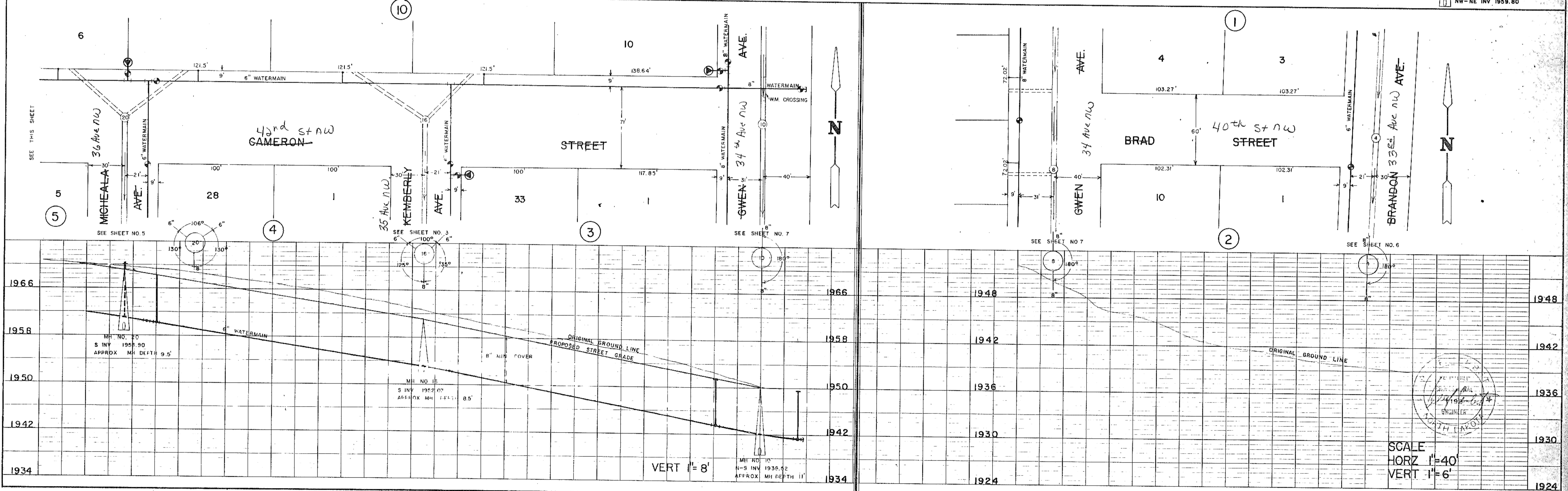


SCALE  
 HORZ 1"=40'  
 VERT 1"=6'

DATE	
BY	
REVISIONS	
NOTED	
ALIGNMENT CHECKED	
NOTE BOOK	
NO.	
DATE	
BY	
REVISIONS	
NOTED	
ALIGNMENT CHECKED	
NOTE BOOK	
NO.	

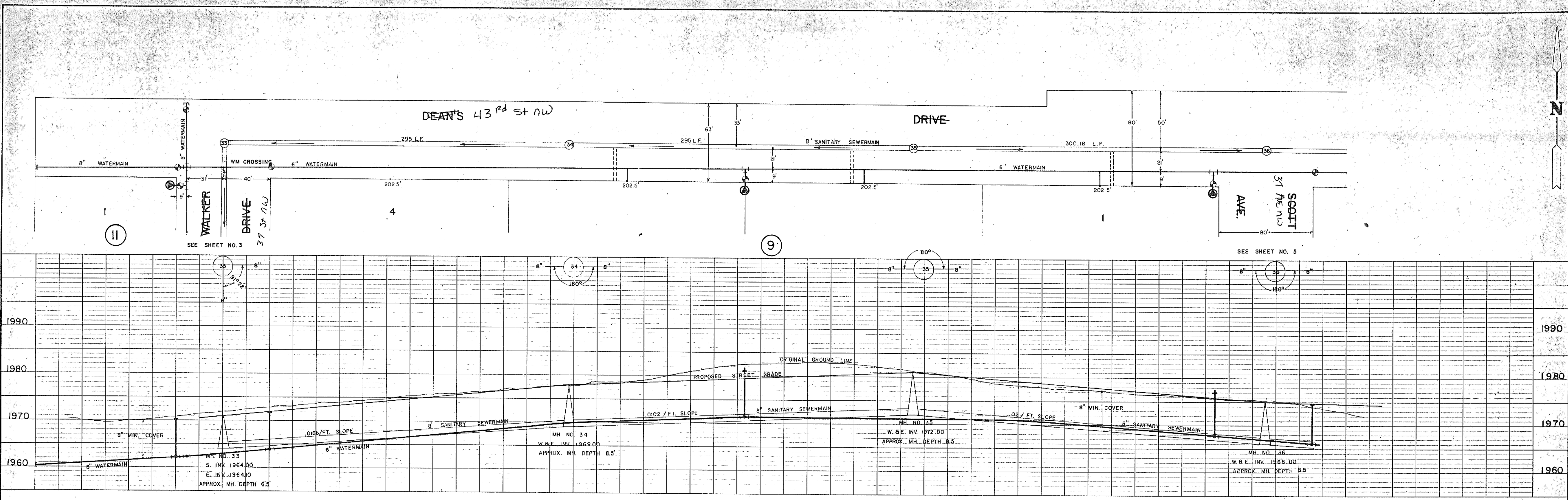


DATE	
BY	
REVISIONS	
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ALIGNMENT CHECKED	
NOTE BOOK	
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DATE	
BY	
REVISIONS	
NOTED	
ALIGNMENT CHECKED	
NOTE BOOK	
NO.	

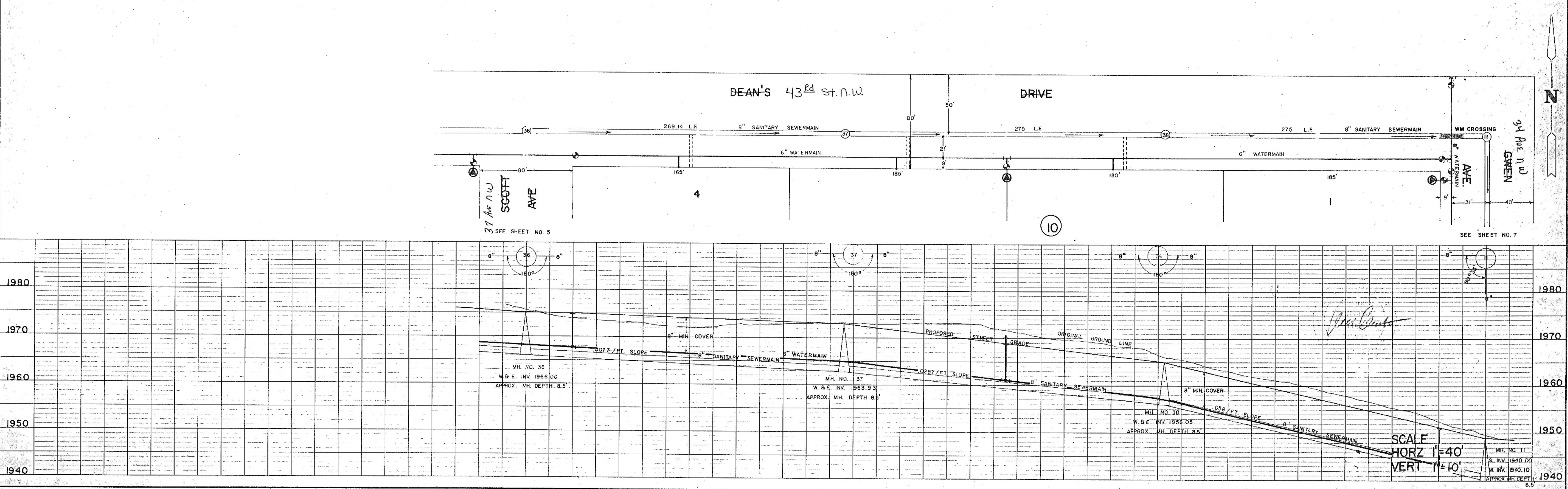




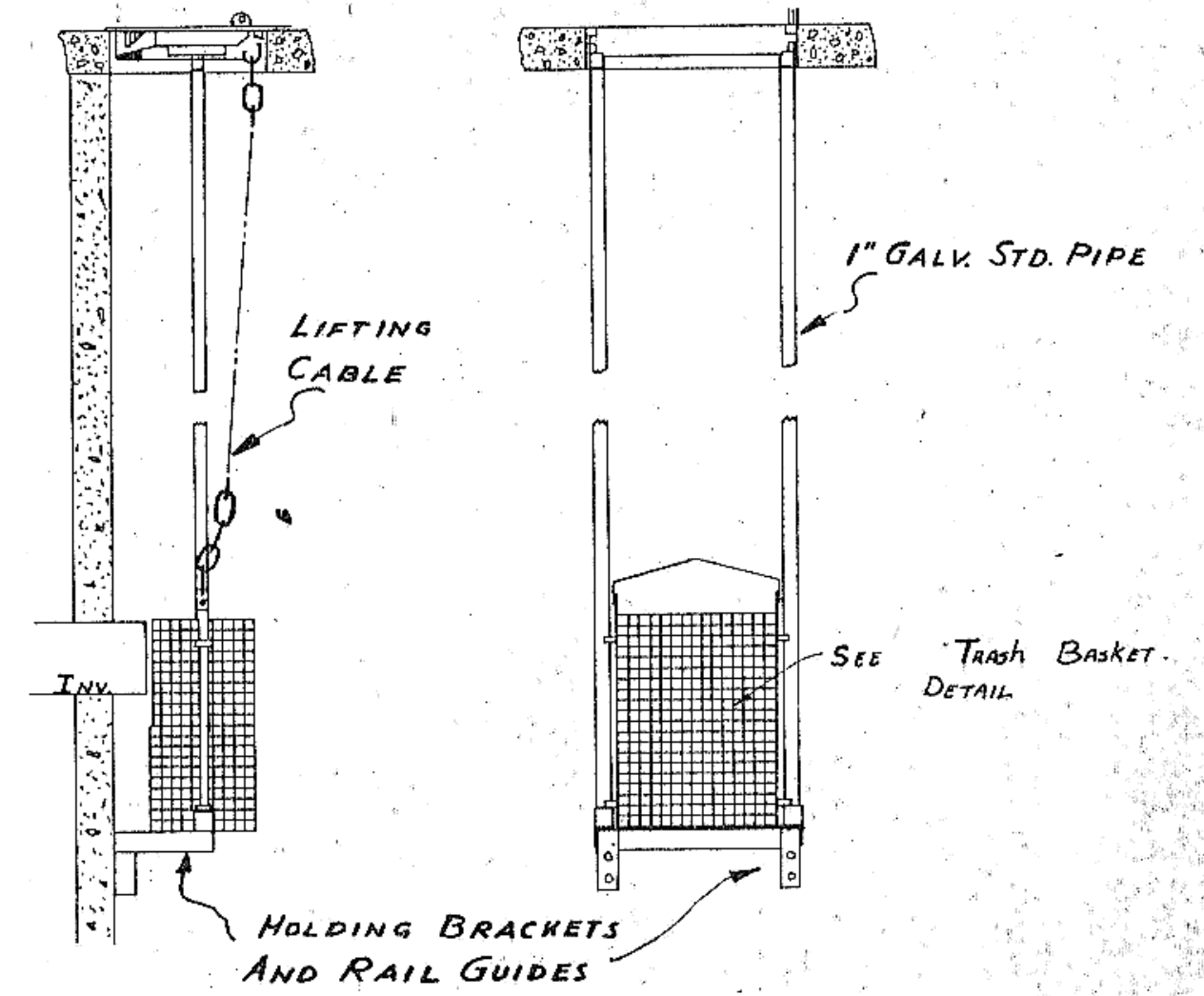
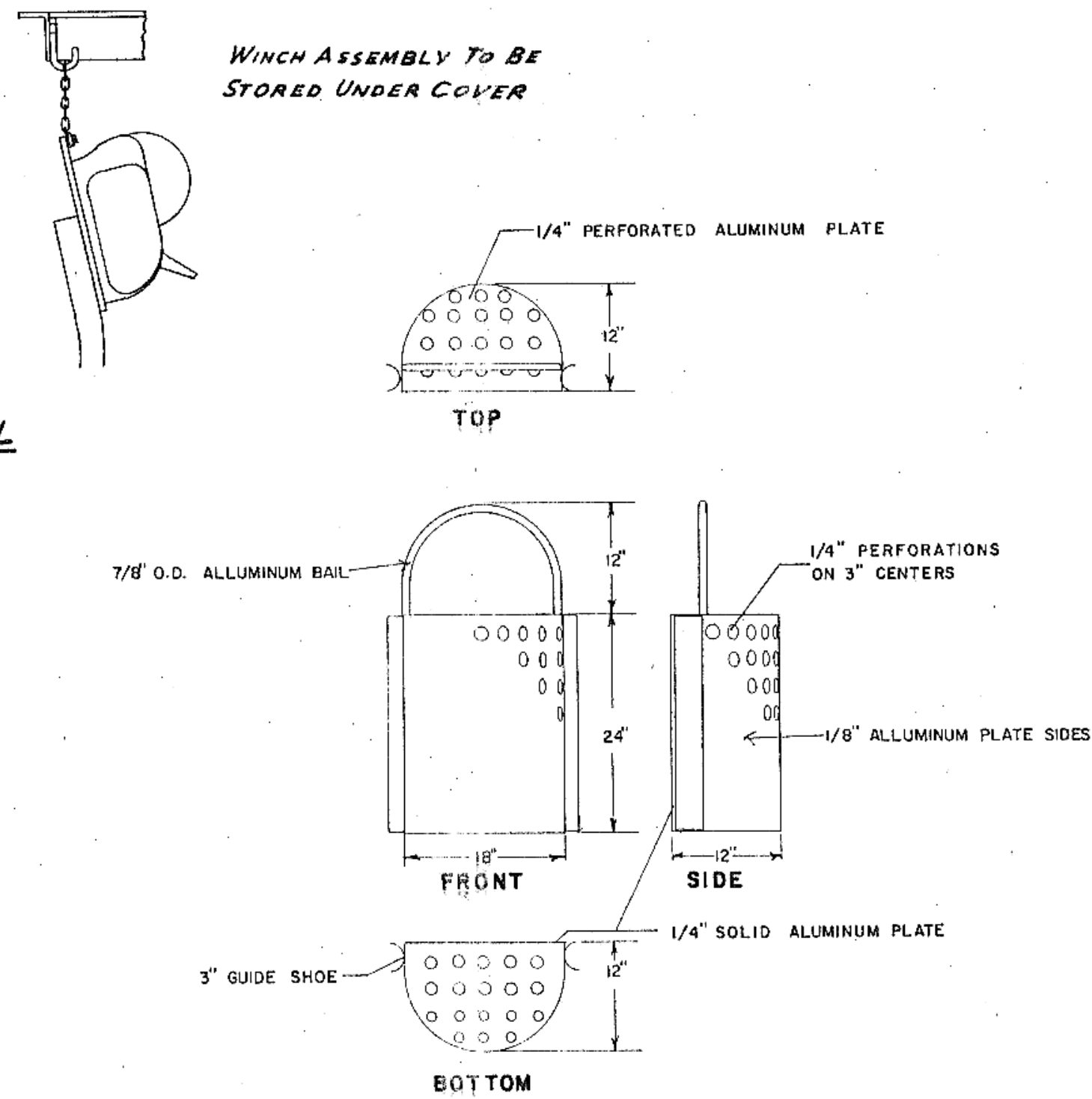
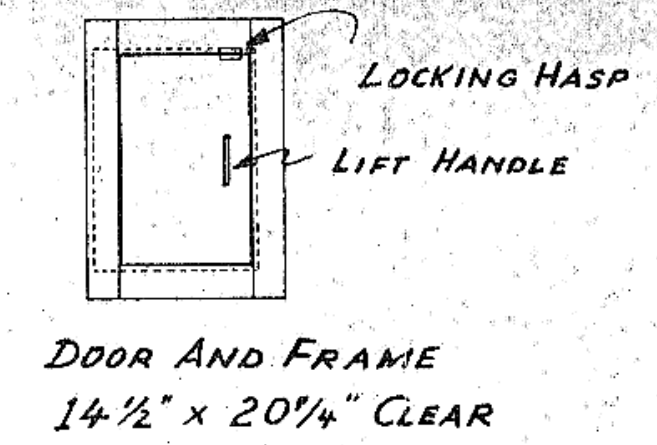
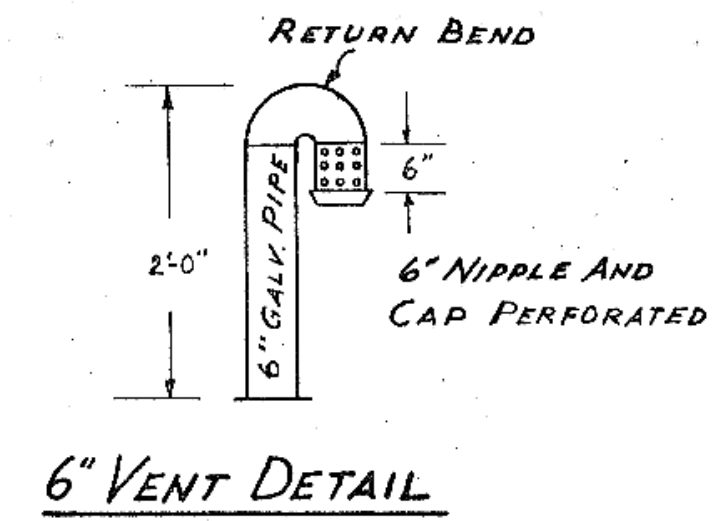
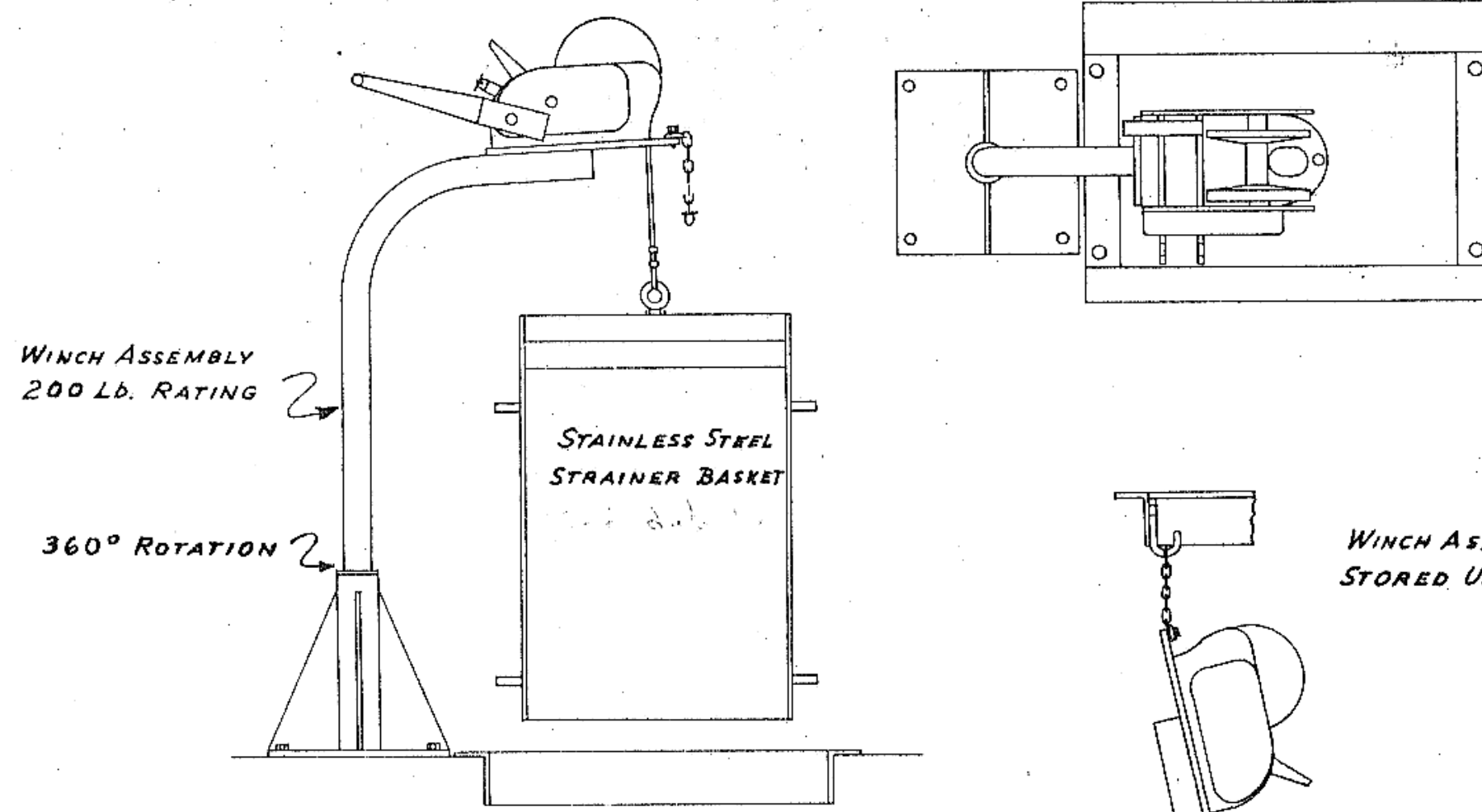
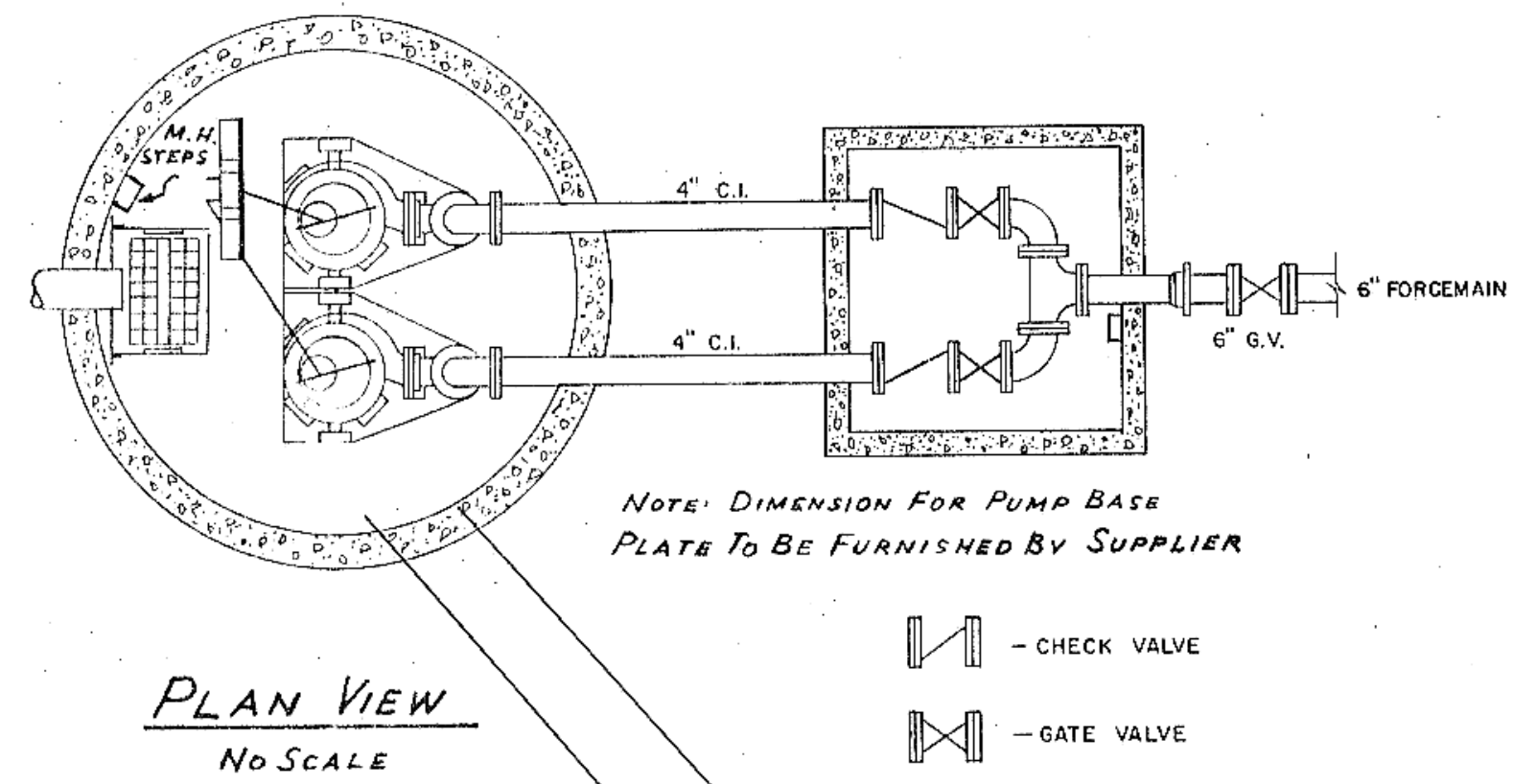
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 BY: \_\_\_\_\_  
 SURVEIL: \_\_\_\_\_  
 PLAN: \_\_\_\_\_  
 NOTE BOOK: \_\_\_\_\_  
 NO. \_\_\_\_\_



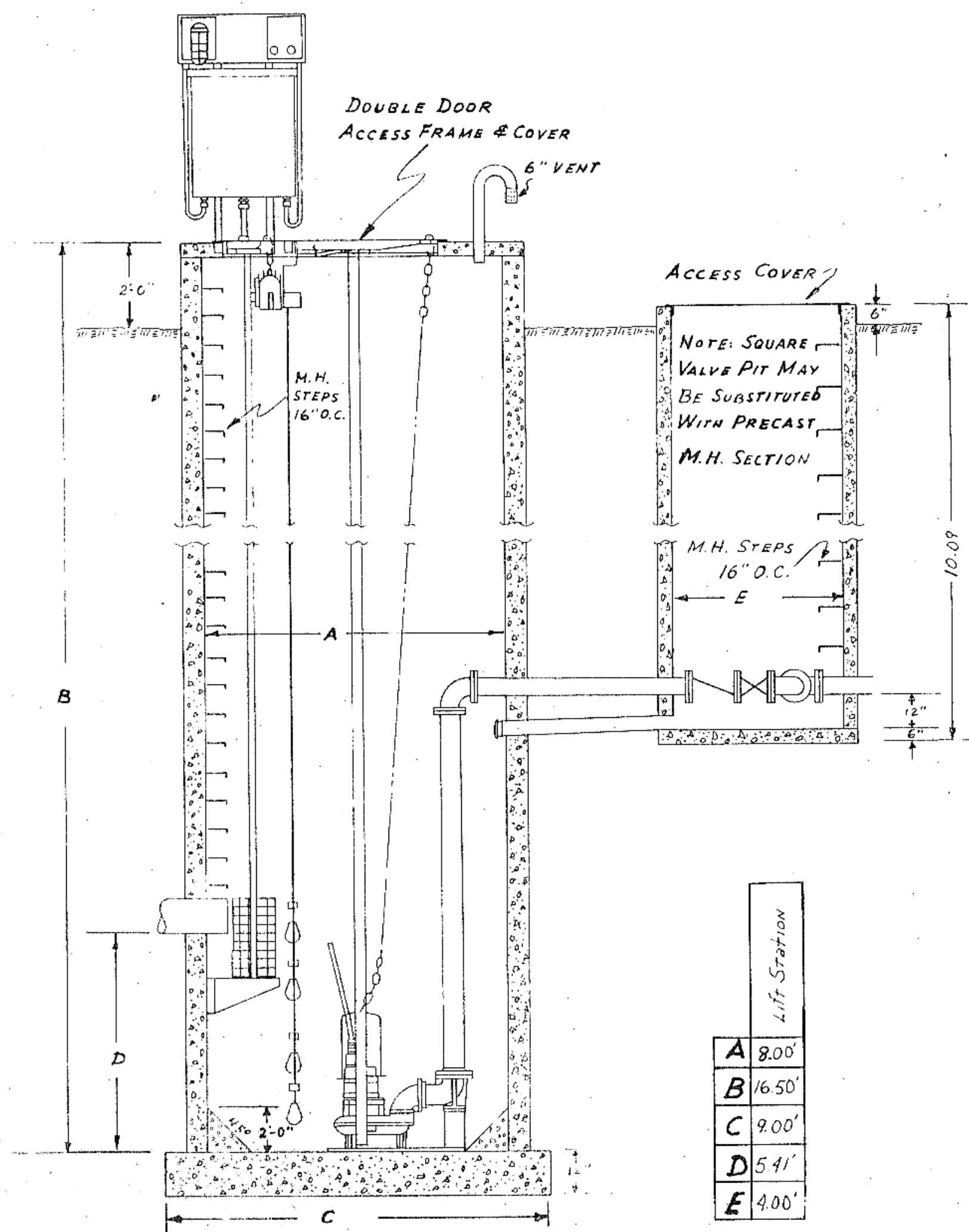
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 BY: \_\_\_\_\_  
 SURVEIL: \_\_\_\_\_  
 PROFILE: \_\_\_\_\_  
 NOTE BOOK: \_\_\_\_\_  
 NO. \_\_\_\_\_



SCALE  
 HORZ 1"=40'  
 VERT 1"=10'

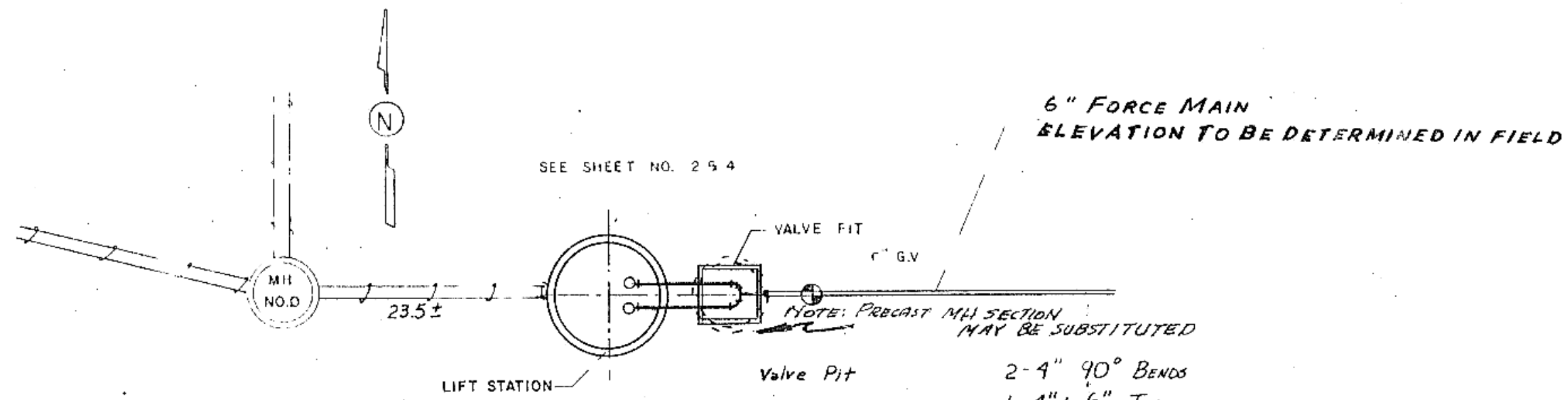


**STRAINER BASKET MOUNTING DETAIL**

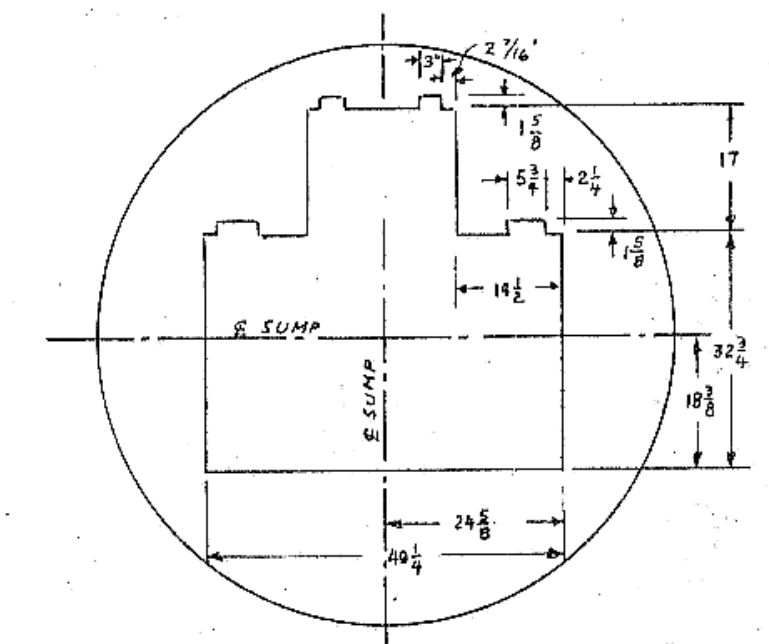


**DIMENSIONS**

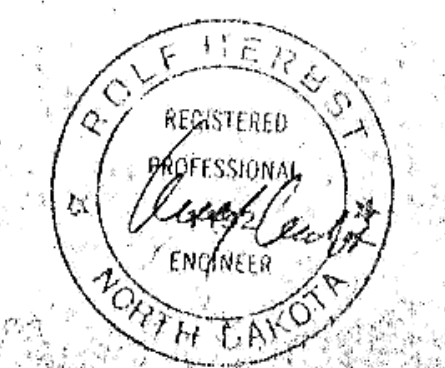
Station	Height
A	8.00'
B	16.50'
C	9.00'
D	5.41'
E	4.00'



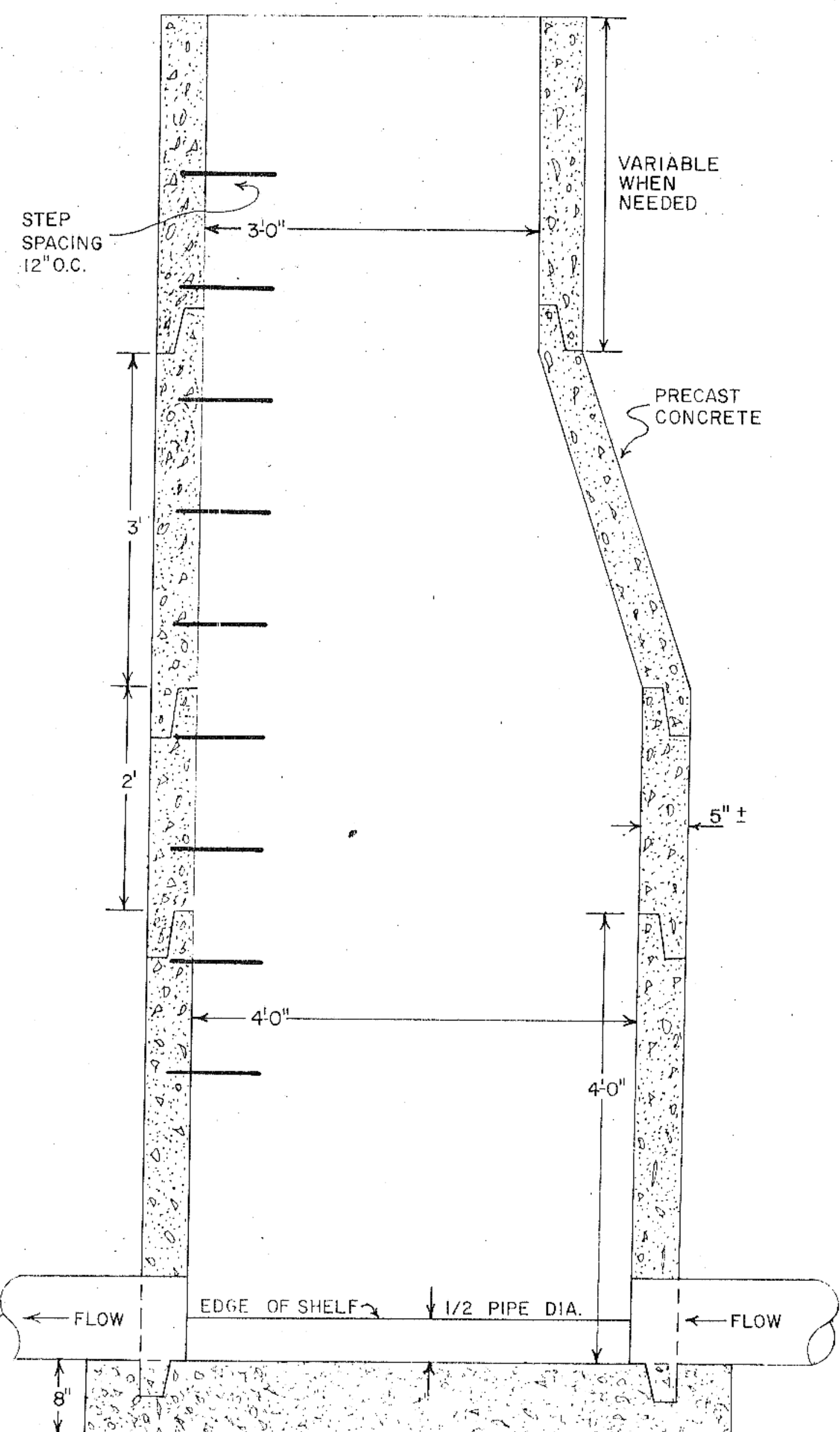
- 2-4" 90° BENDS
- 1-4" to 6" Tee
- 2-4" Check Valve
- 2-4" Gate Valve
- 1-6" Gate Valve



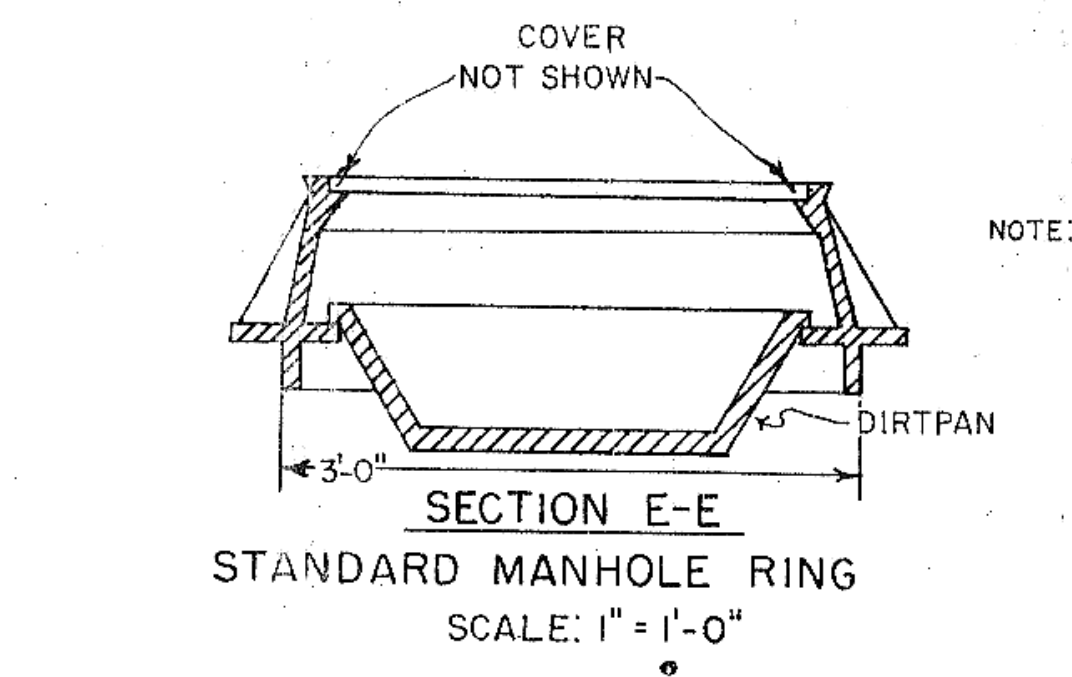
**CUT OUT DETAIL FOR SUMP COVER**



Project	CONSOLIDATED W&S IMPR. DIST. # 24		
Detail	SCALE	DRAWN BY	R.S.
SATELLITE LIFT STATION	NONE	REVISED	
<b>TOMAN ENGINEERING CO.</b>			
Engineering and Environmental Consultants - Madison, N.D. - Rosemount, Manitoba			
DATE	APPROVED BY	DRAWING NUMBER	
SEPR 76			

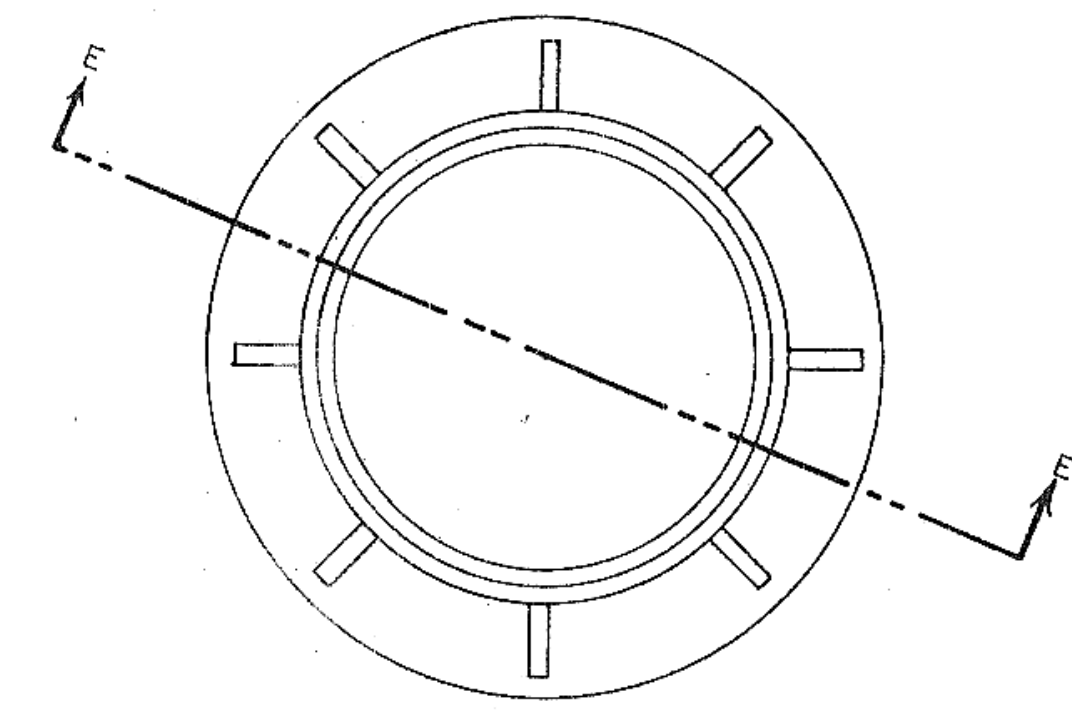


TYPICAL MANHOLE ELEVATION VIEW  
SCALE: 1" = 1'-0"

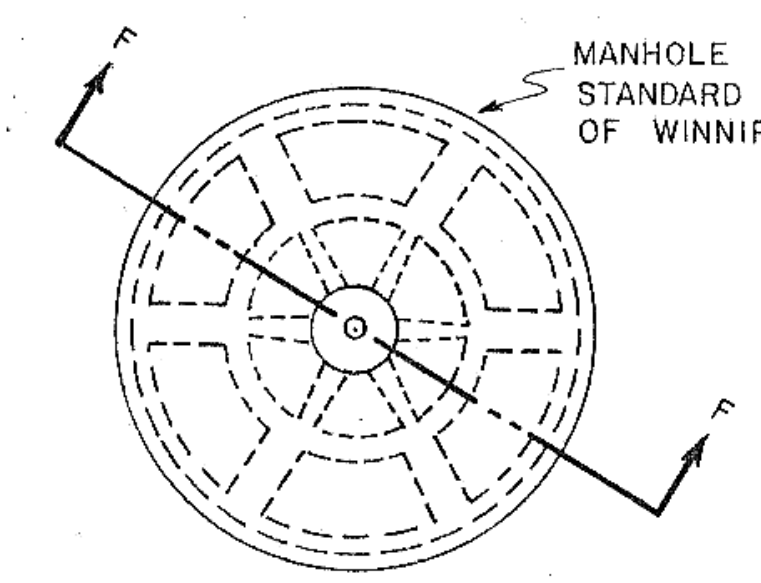


SECTION E-E  
STANDARD MANHOLE RING  
SCALE: 1" = 1'-0"

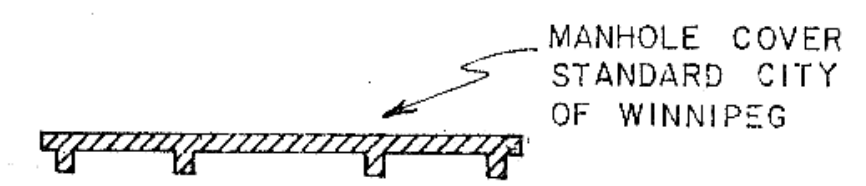
NOTE: DIRT PAN TO FIT PARTICULAR MANHOLE RING FURNISHED FOR JOB.  
DIRTPAN FOR MANHOLE WHEN CALLED FOR IN EITHER THE PLANS OR SPECIFICATIONS.



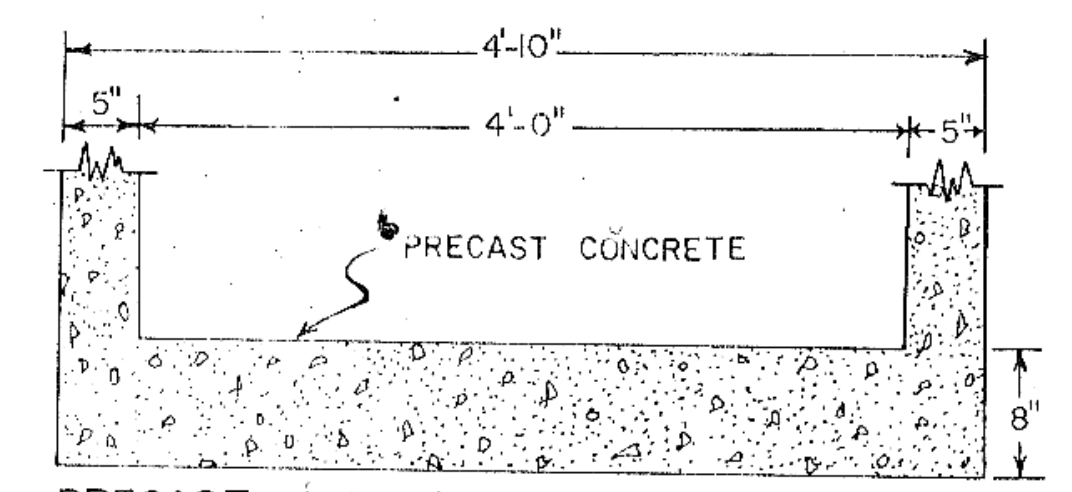
STANDARD MANHOLE RING  
PLAN VIEW  
SCALE: 1" = 1'-0"



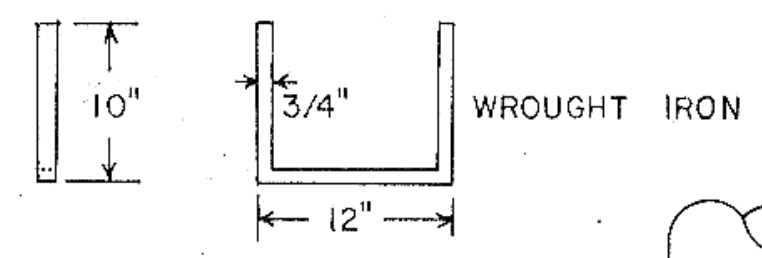
STANDARD MANHOLE COVER  
PLAN VIEW  
SCALE: 1" = 1'-0"



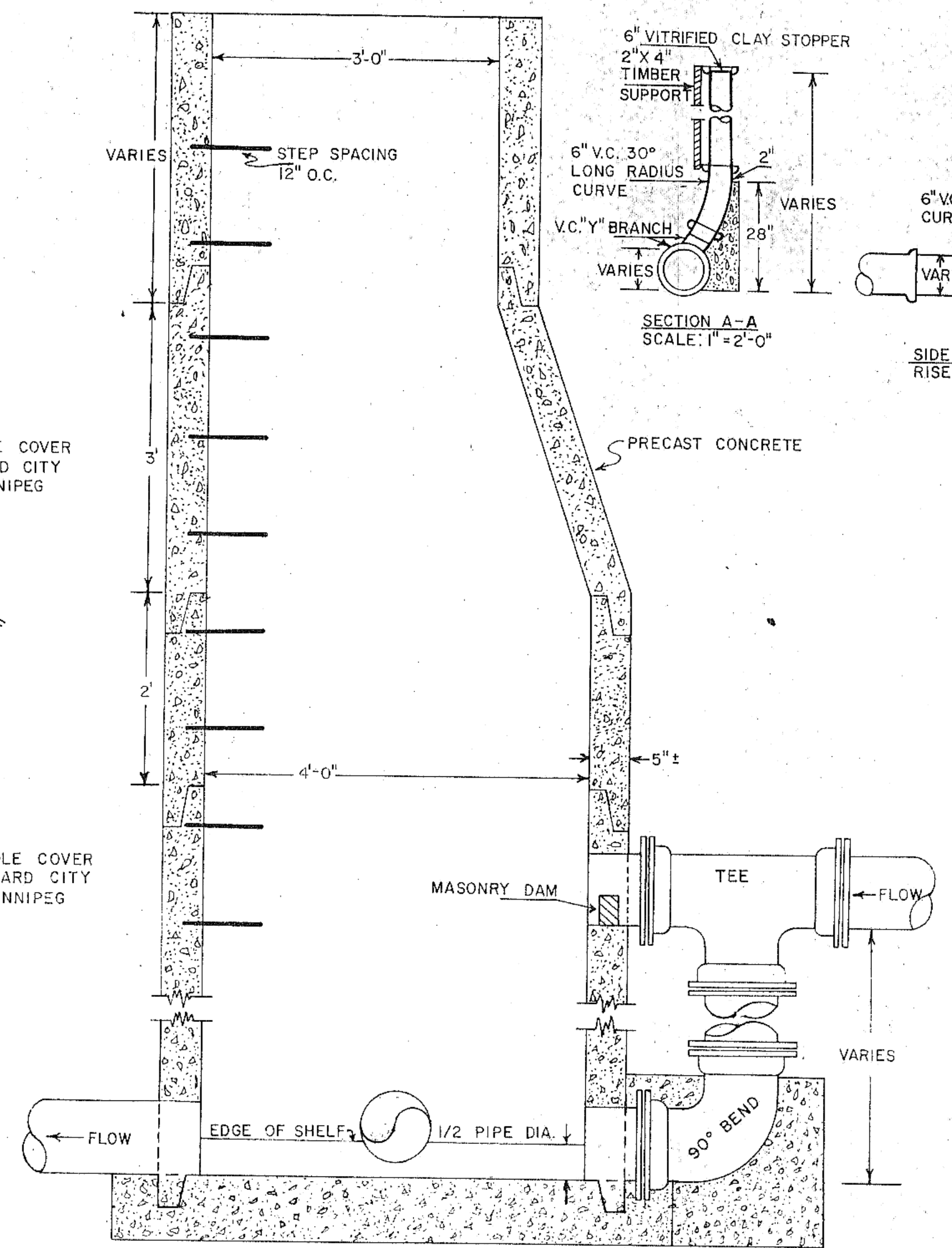
SECTION F-F  
STANDARD MANHOLE COVER  
SCALE: 1" = 1'-0"



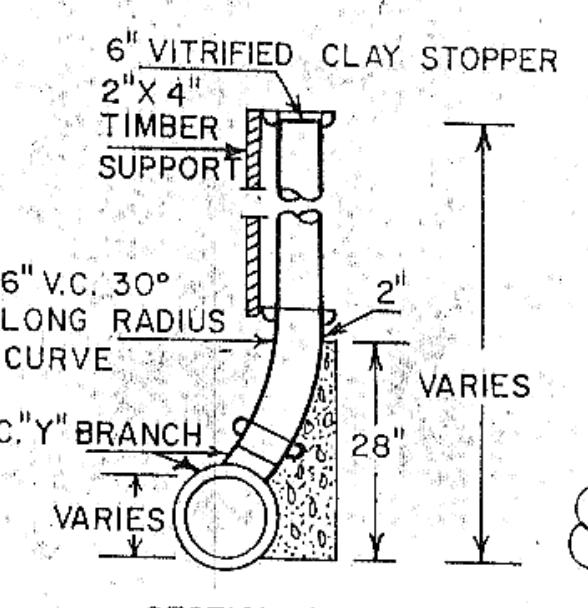
PRECAST MANHOLE FLOOR DETAIL  
SCALE: 1" = 1'-0"



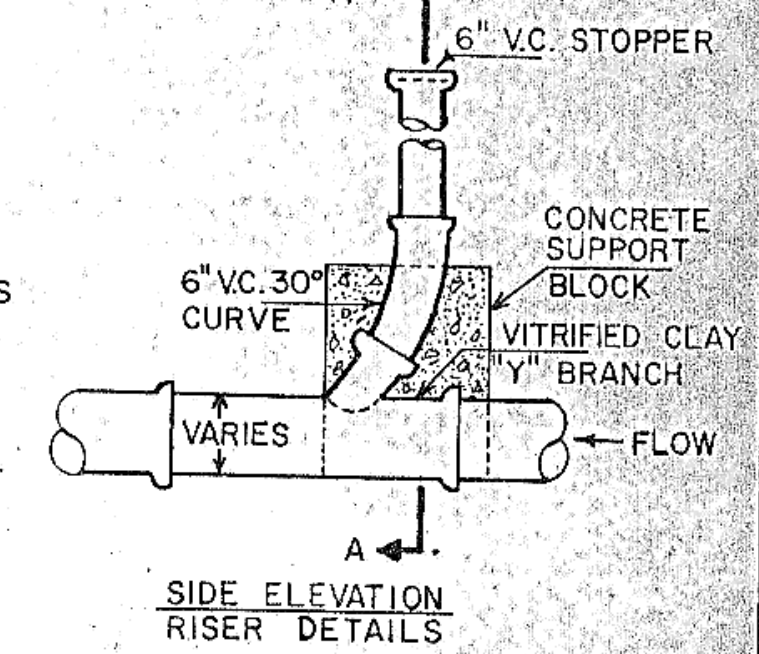
STEP DETAILS  
SCALE: 1" = 1'-0"



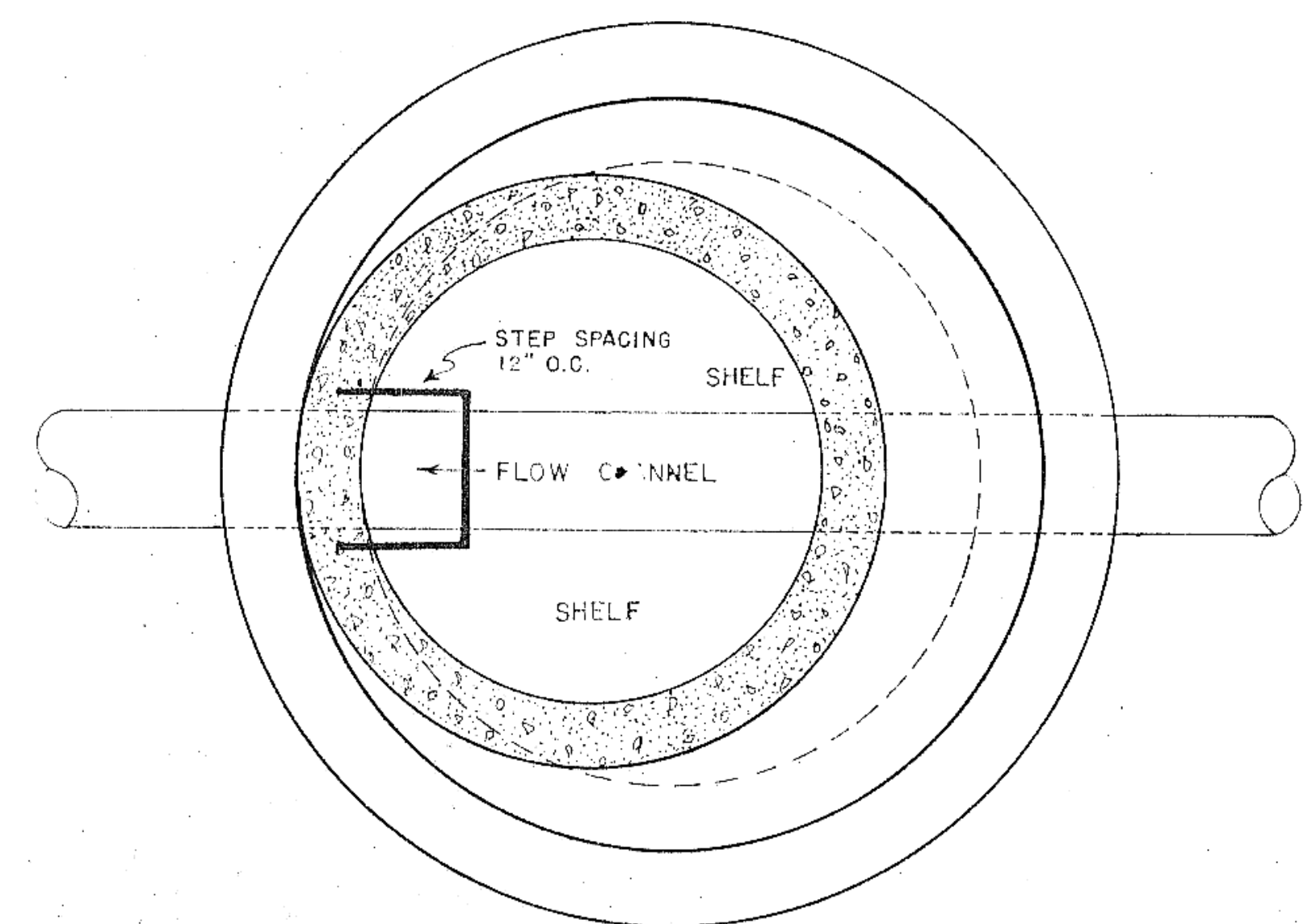
TYPICAL DROP AND/OR JUNCTION MANHOLE ELEVATION  
SCALE: 1" = 1'-0"



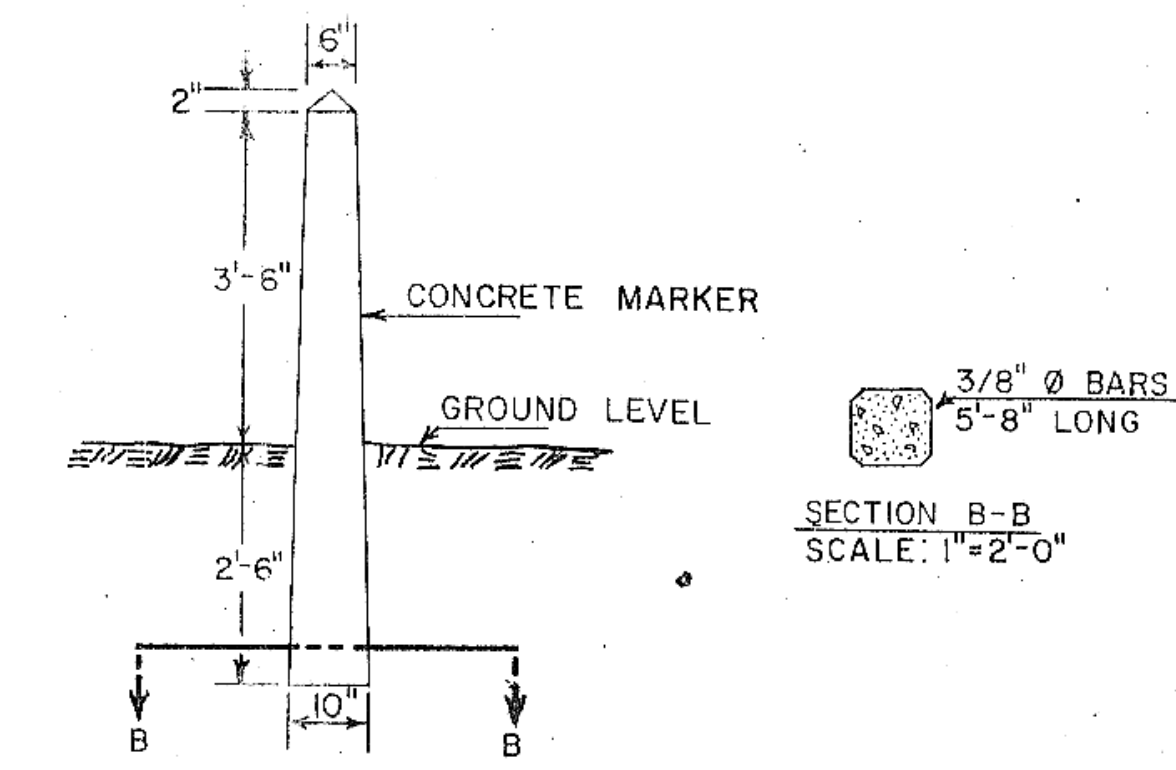
SECTION A-A  
SCALE: 1" = 2'-0"



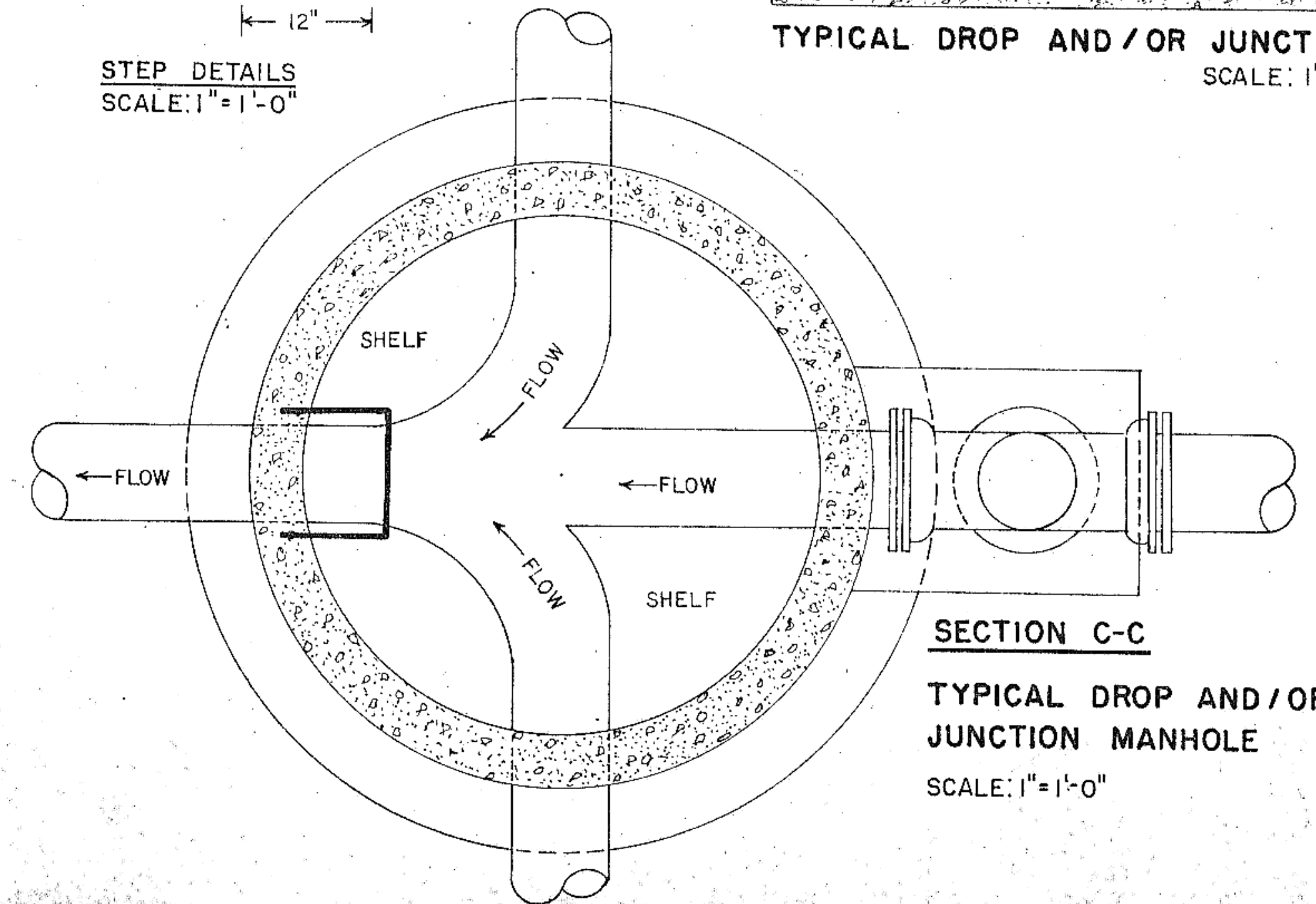
SIDE ELEVATION  
RISER DETAILS



TYPICAL MANHOLE  
SECTION D-D  
SCALE: 1" = 1'-0"



ELEVATION - TYPICAL REFERENCE MARKER  
SCALE: 1" = 2'-0"

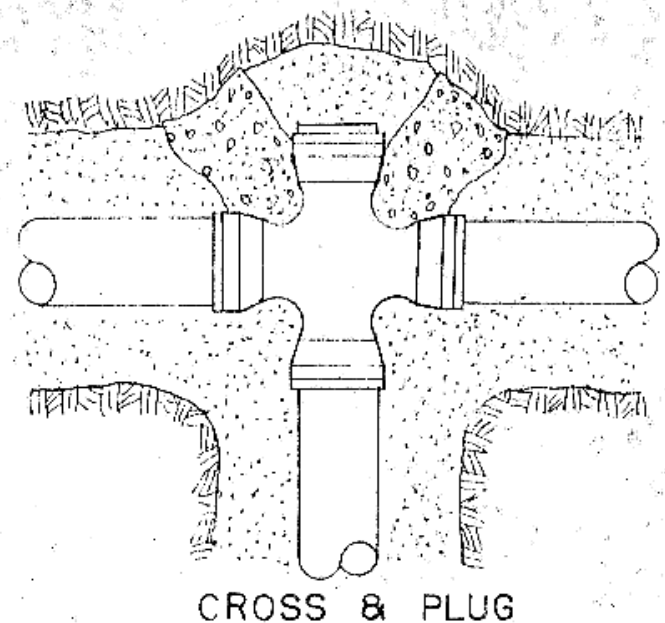


SECTION C-C  
TYPICAL DROP AND/OR  
JUNCTION MANHOLE  
SCALE: 1" = 1'-0"

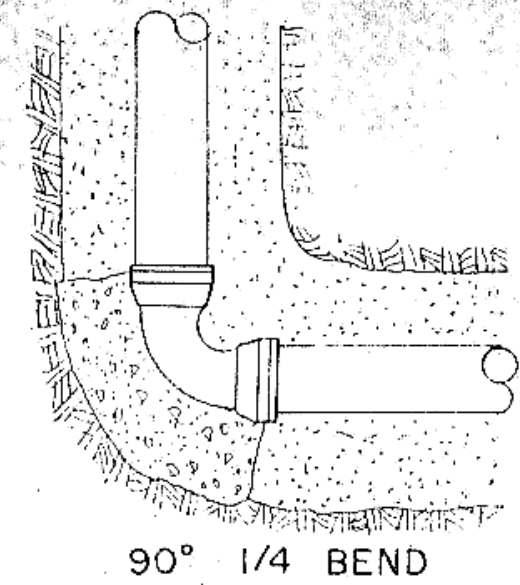


W.S. IMP. DIST. NO. 24

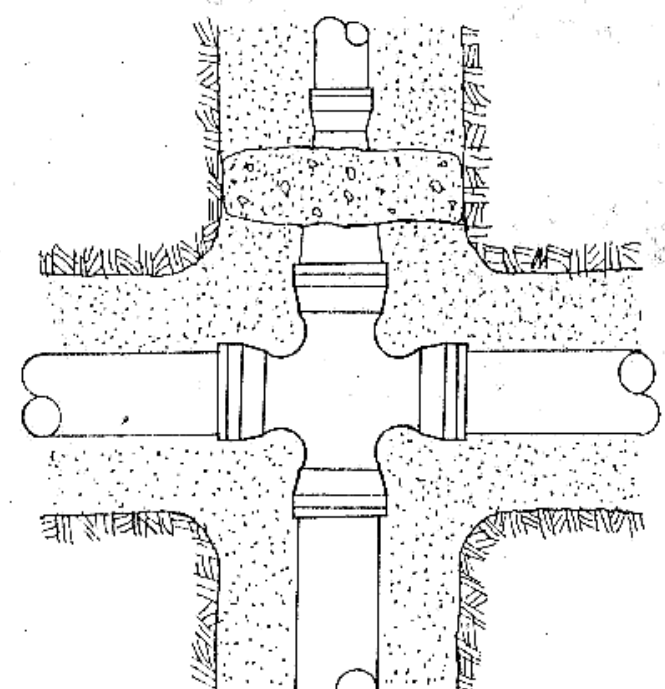
THRUST BLOCK DETAILS



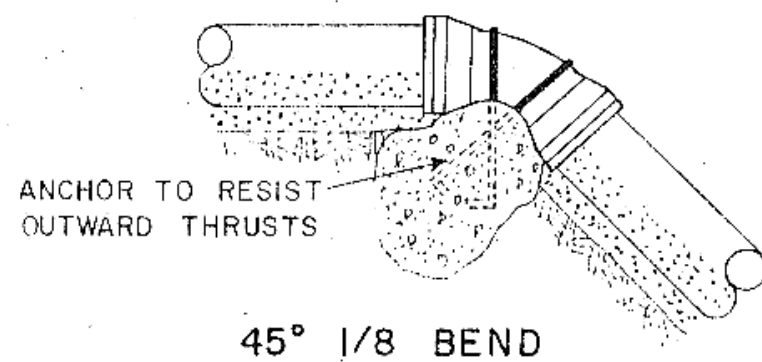
CROSS & PLUG



90° 1/4 BEND

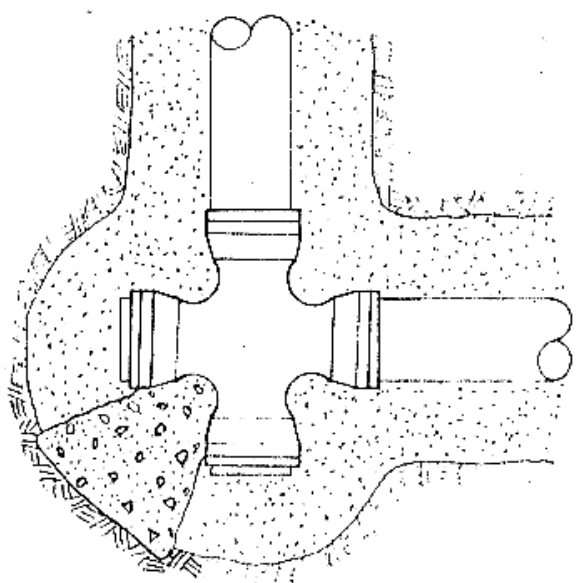


CROSS & REDUCER

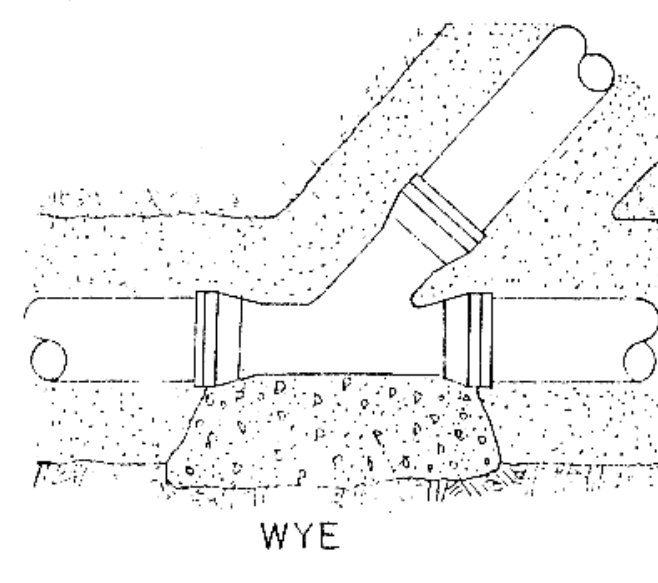


ANCHOR TO RESIST OUTWARD THRUSTS

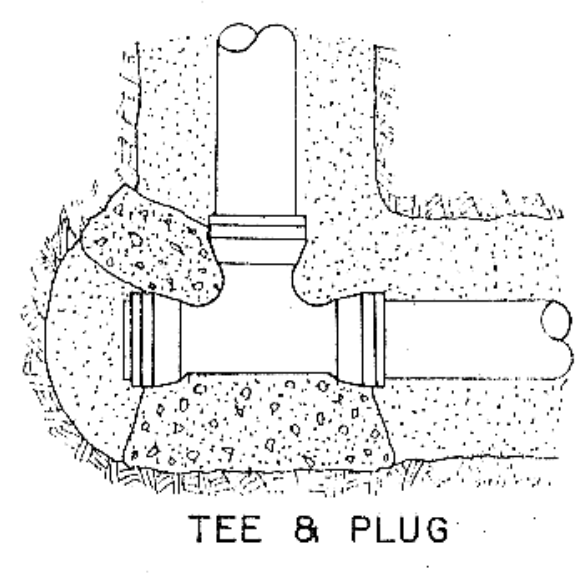
45° 1/8 BEND  
22 1/2° 1/16 BEND



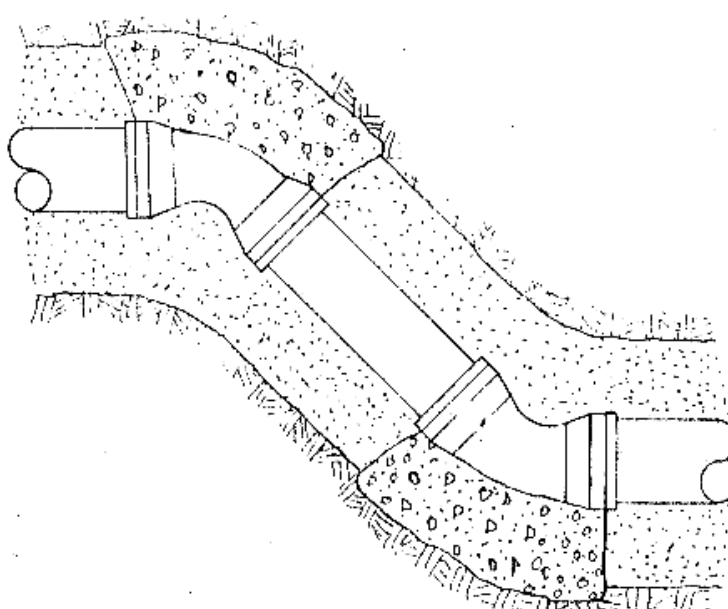
CROSS & PLUGS



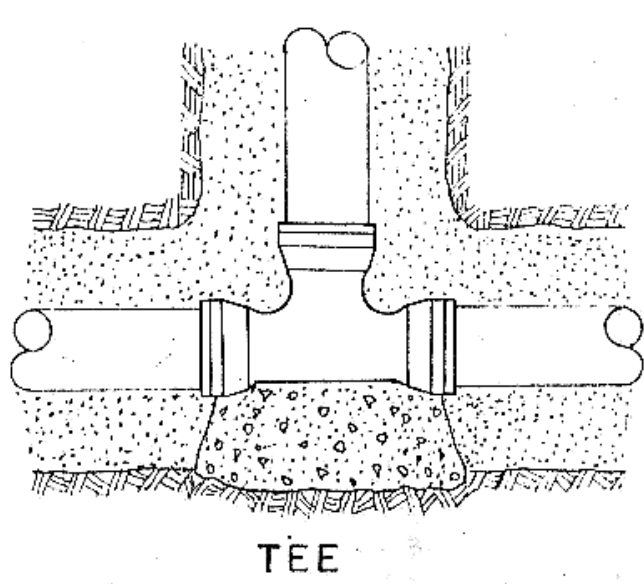
WYE



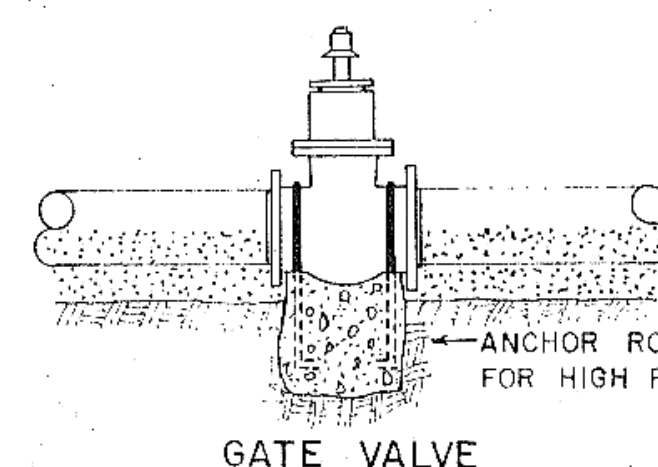
TEE & PLUG



45° 1/8 OFFSET

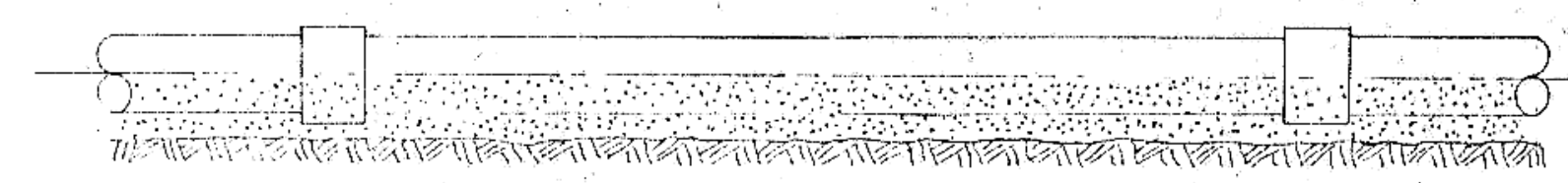


TEE

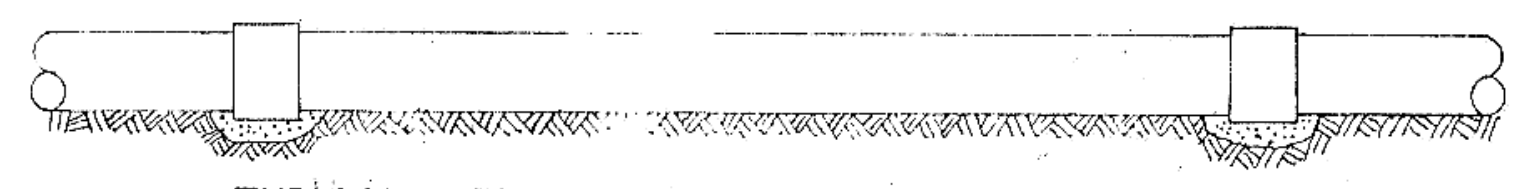


GATE VALVE

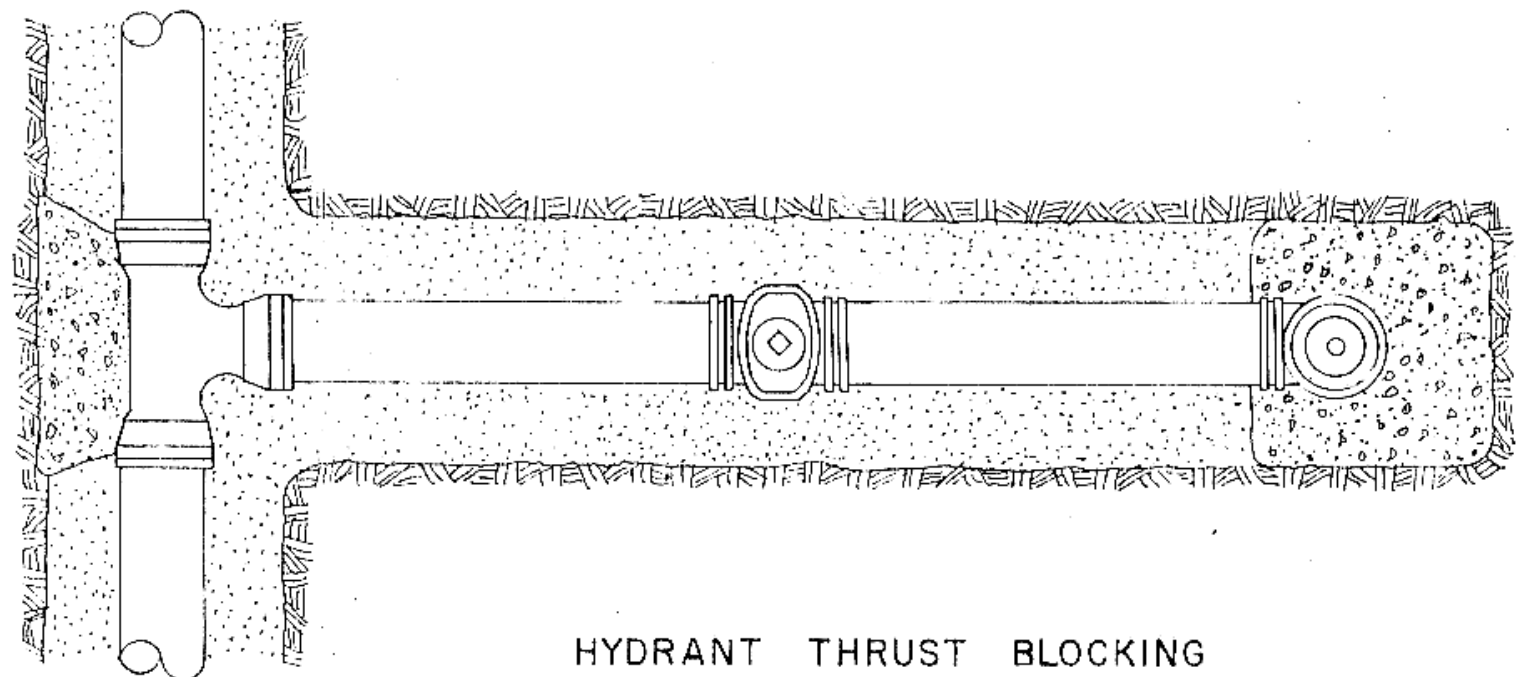
ANCHOR RODS REQUIRED FOR HIGH PRESSURE AREAS



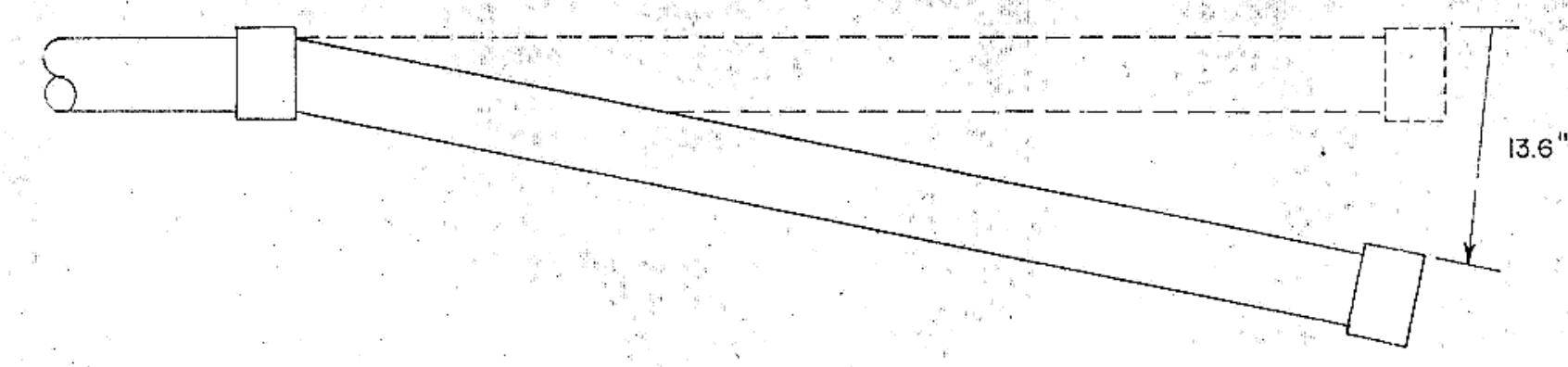
SAND CUSHION BEDDING-SUPPORT ENTIRE LENGTH OF PIPE  
SPECIAL COMPACTION REQUIRED TO PIPE SPRING LINE



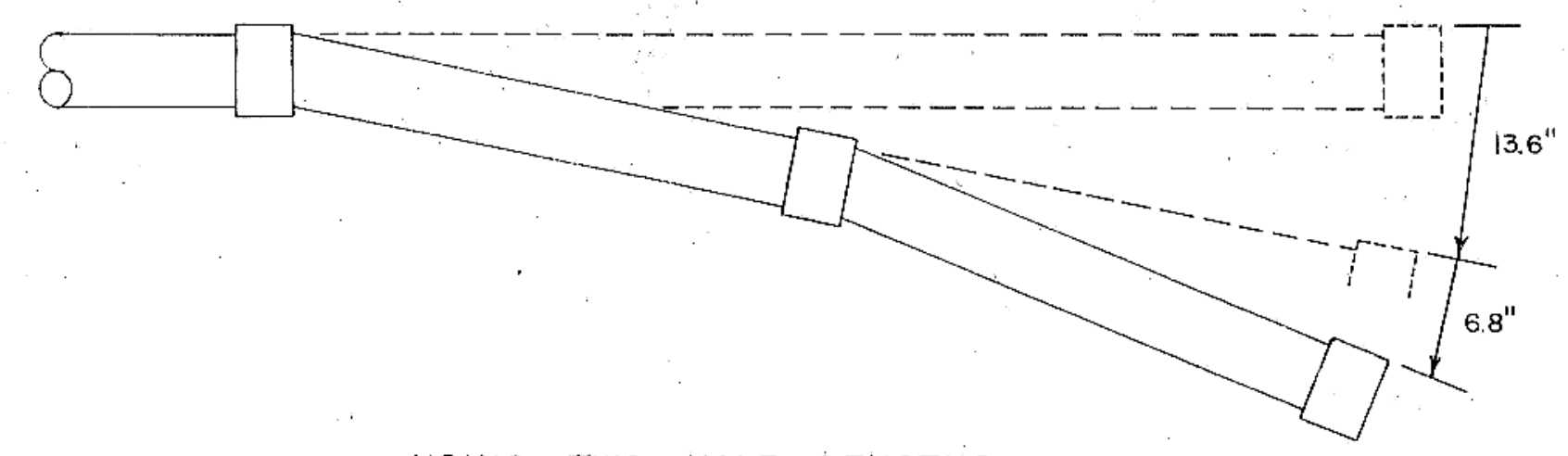
TYPICAL BEDDING TREATMENT USING APPROVED  
OR SITE MATERIAL SHAPED FOR PIPE



HYDRANT THRUST BLOCKING



MAX. OFFSET PER 13' LENGTH  
ASBESTOS CEMENT PIPE

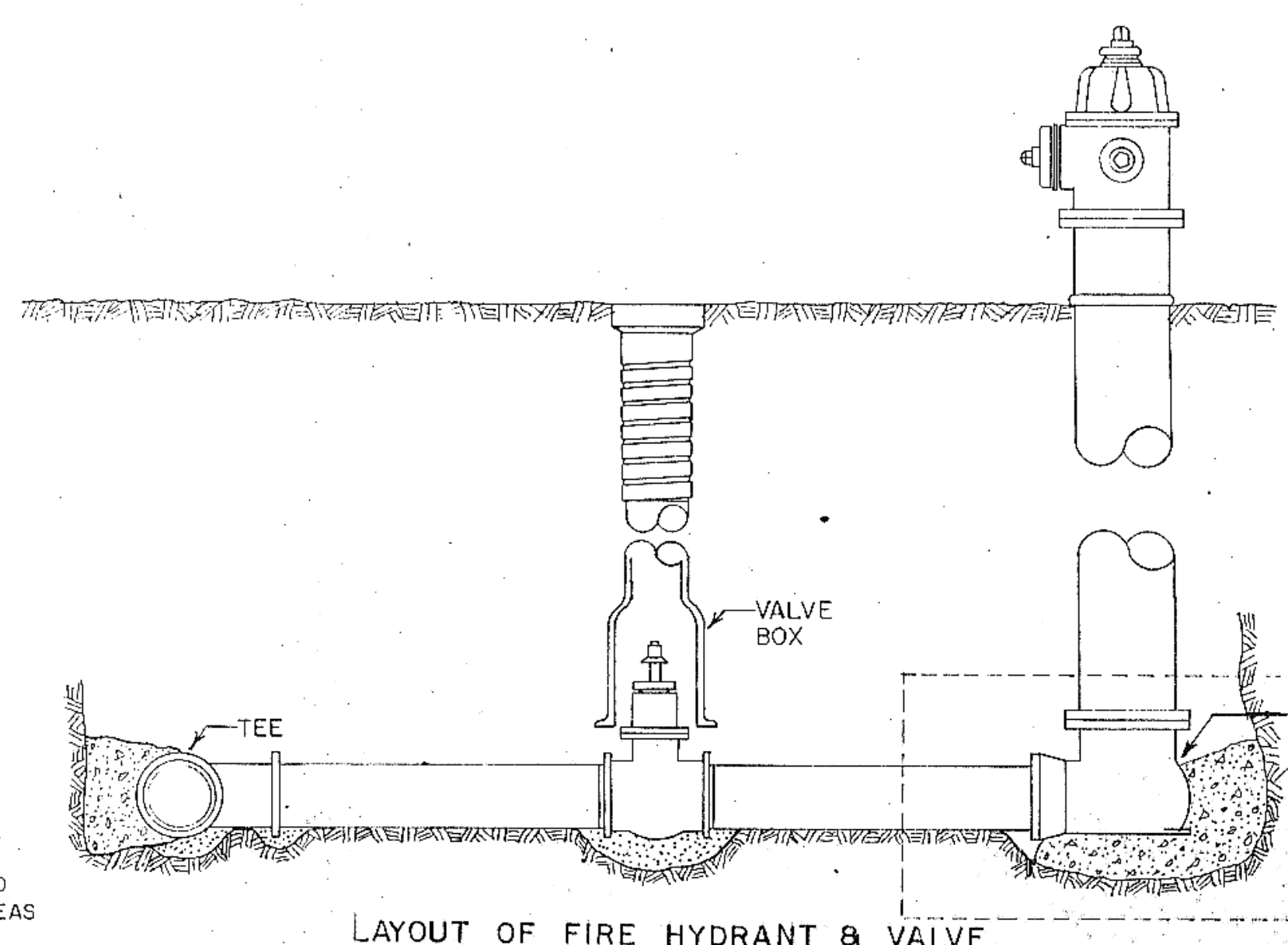


USING TWO HALF LENGTHS  
ASBESTOS CEMENT PIPE

- NOTE: (1) ALL TYPES OF PIPE TO BE TREATED IN THE SAME GENERAL MANNER AS ASBESTOS CEMENT PIPE FOR DEFLECTIONS.  
(2) BEDDING REQUIREMENTS SHALL BE AS INDICATED HEREON UNLESS MODIFIED IN THE SPECIFICATIONS.  
(3) CONCRETE FOR THRUST BLOCKS SHALL HAVE MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 3,000 PSI, AND MAX. SLUMP OF 3 INCHES AT TIME OF PLACEMENT.

LEGEND

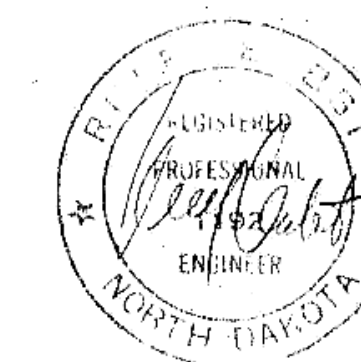
- CONCRETE
- SITE SOIL
- SELECT BACKFILL



LAYOUT OF FIRE HYDRANT & VALVE

DASHED LINES SHOW OUTLINE OF CRIB TO BE USED WHEN PERCOLATION IS NEGLIGIBLE, FILL WITH COARSE GRAVEL OR ROCK TO PROVIDE A MINIMUM EFFECTIVE LEACHING CAPACITY OF AT LEAST ONE CUBIC YARD (4' X 4' X 2')

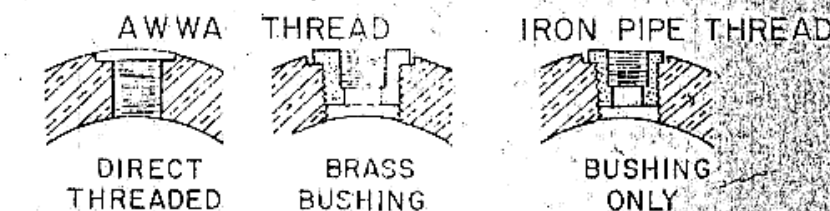
HYDRANT DRAIN OPENING TO BE UNOBSTRUCTED



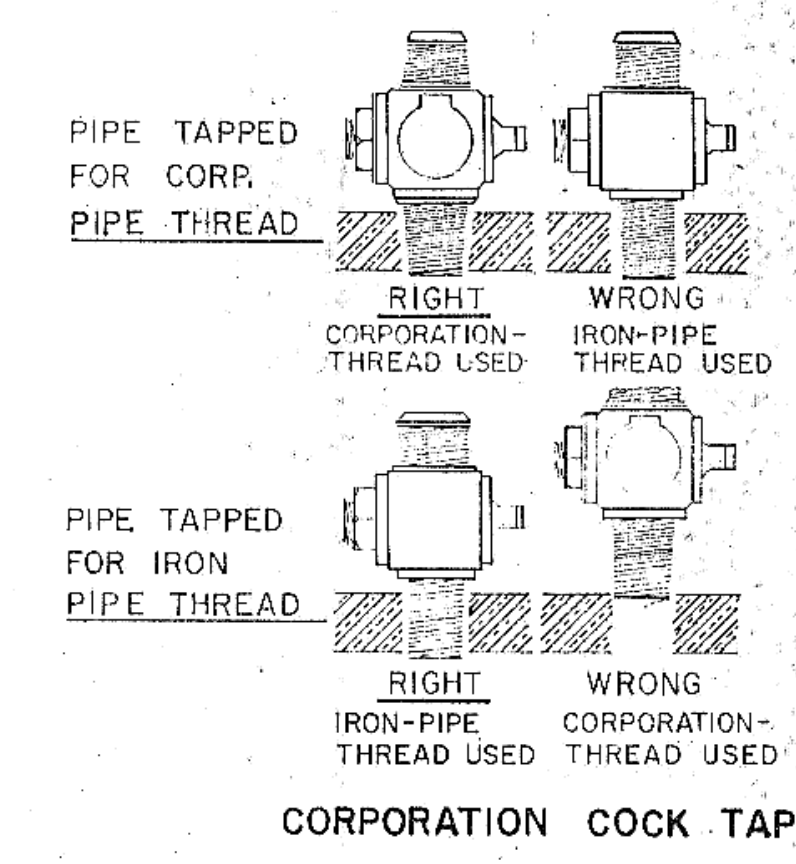
MAXIMUM SIZE OF OUTLET RECOMMENDED WITH SERVICE CLAMPS (INCHES)

NOMINAL PIPE SIZE	OUTLET SIZE - (CLASSES 100-150/200)	
	SINGLE STRAP	DOUBLE STRAP
4"	1"	1"
6"	1 1/2"	1 1/2"
10"	2"	2"
12"	2"	2"
14"	2"	2"
16"	2"	2"

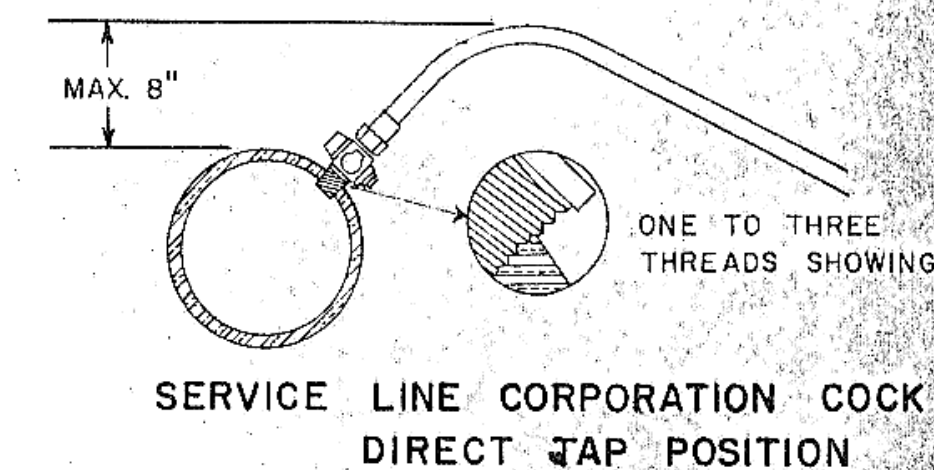
SADDLES FOR ASBESTOS CEMENT PIPE



THREAD TREATMENT  
A-C PIPE



CORPORATION COCK TAPPING



SERVICE LINE CORPORATION COCK  
DIRECT TAP POSITION

W&S IMP. DIST. NO. 24

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