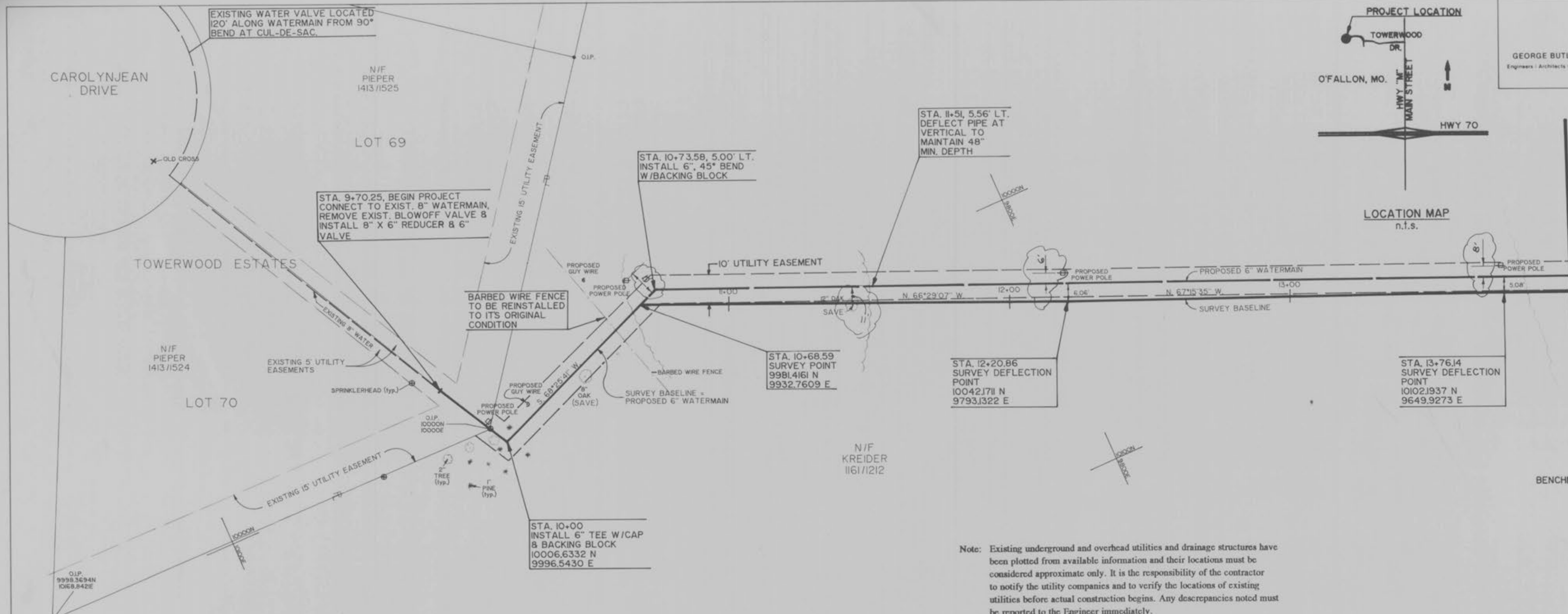
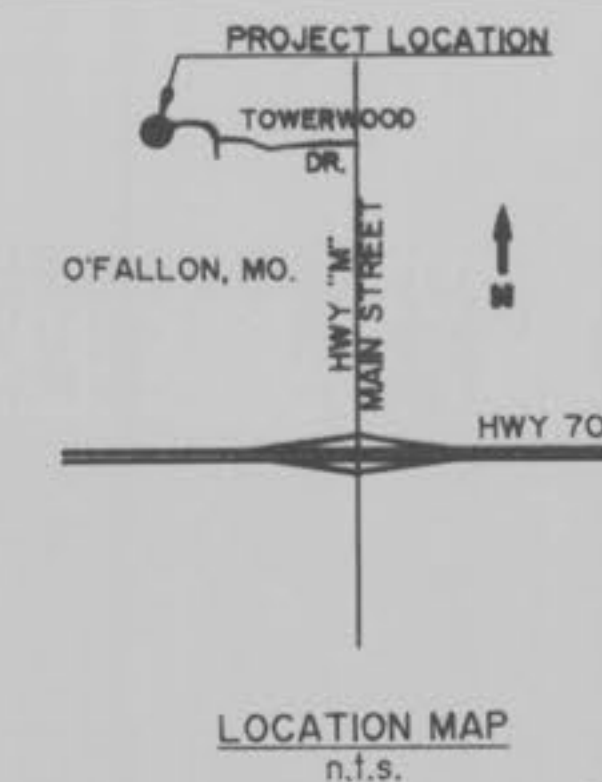




GEORGE BUTLER ASSOCIATES, INC.
Engineers | Architects | Landscape Architects | Planners

PROJECT	SHEET NO.	TOTAL SHEETS
KREIDER WATERMAIN EXTENSION	1	3
PROJECT NO.: 6934	DATE: NOV 1993	

REVISIONS:
AS-BUILT JG 10-1-94 Dimensions

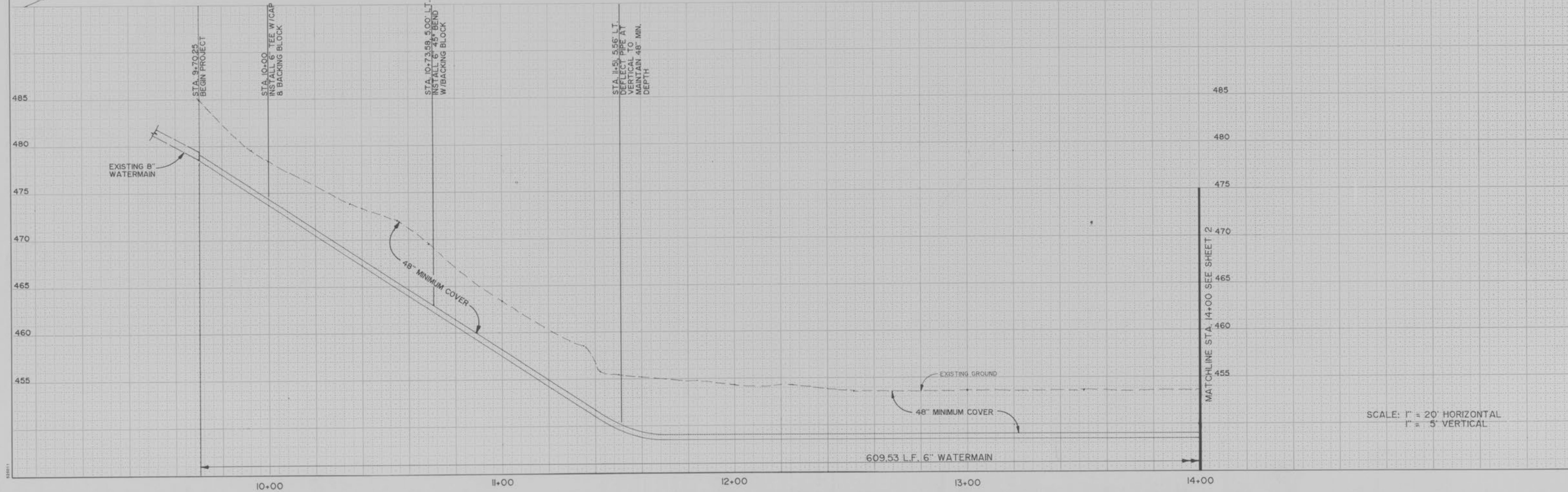


SCALE: 1" = 20'

BENCHMARK: TOP OF SAN. MANHOLE "C" (TAKEN FROM AS-BUILT PLANS OF TOWERWOOD ESTATES SUBD. BY BAX ENG. DATED 11-10-88) ELEVATION: 482.11

TBM: 60d NAIL IN SOUTH FACE 12" DEAD ASH TREE, 25' NORTH OF SURVEY POINT # STA. 15+77.75 ELEVATION: 465.19

Note: Existing underground and overhead utilities and drainage structures have been plotted from available information and their locations must be considered approximate only. It is the responsibility of the contractor to notify the utility companies and to verify the locations of existing utilities before actual construction begins. Any discrepancies noted must be reported to the Engineer immediately.



SCALE: 1" = 20' HORIZONTAL
1" = 5' VERTICAL

KREIDER WATER MAIN AS-BUILT



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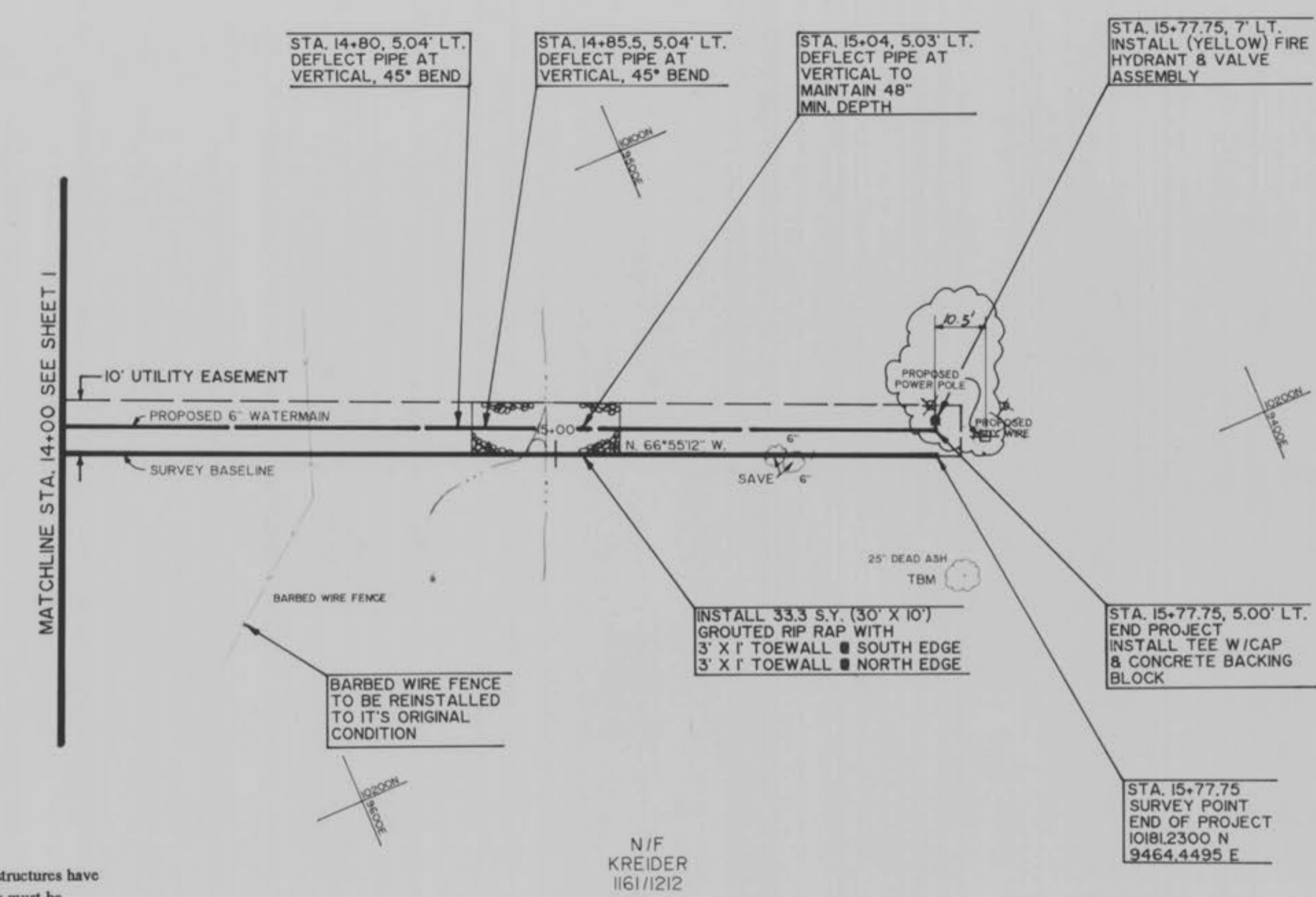
PROJECT	SHEET NO.	TOTAL SHEETS
KREIDER WATERMAIN EXTENSION	2	3
PROJECT NO.: 6934	DATE: NOV 1993	
REVISIONS:		
As-Built-JG-10/94		

GENERAL NOTES

- All surface and subsurface conditions disturbed during construction shall be restored to equal or better condition by the contractor. This includes, but is not limited to, pavement, utilities and grass areas.
- Contractor is to contact water and sewer operating authority, Mid-Missouri Engineers (M.M.E.I.), a minimum of 24 hours in advance of construction for line location and valve operation. All valve closings necessary for construction will be done by M.M.E.I. personnel only.
- Known underground structures, telephone conduit, gas, water and sewer pipes, etc., close enough to be affected by the work, are shown on the plans, although others may exist. The locations shown are believed to be reasonably correct, but do not purport to be absolutely so. Before starting work, the Contractor shall notify all utilities involved, and shall request them for cooperation in locating lines in advance of the work. The Contractor shall make reasonable effort to avoid breaking utility lines. The utility shall be notified immediately should a break occur in a line during construction under this Contract. Any lines so broken by the Contractor shall be repaired, according to the utility company's standards, at the expense of the Contractor.
- Contractor shall field verify the location and depth of the existing 8 inch watermain shown in the plan view prior to beginning of construction. The Contractor shall make reasonable effort to avoid damage to the existing water main. The Contractor shall repair at his expense any damage to the line due to construction during this contract. If changes to the alignment of the proposed water main are required due to the actual location of the existing 8 inch water main, the Contractor shall obtain approval from the Engineer prior to construction.
- The Owner shall seed and straw all grass areas which are disturbed.
- Contractor is to coordinate water shut-offs with effected property owners.
- Contractor is to save all trees.
- Contractor to notify City of O'Fallon at least 48 hours in advance of construction for coordination of inspection.
- All excavation shall be unclassified and shall comprise the satisfactory removal and disposition of material. Following the removal and stockpiling of topsoil, excavation and filling of every description and of whatever substances encountered shall be performed to the lines and grades indicated on drawings.
- Contractor to provide all testing requirements required by M.M.E.I.
- All existing materials shall be returned to M.M.E.I.

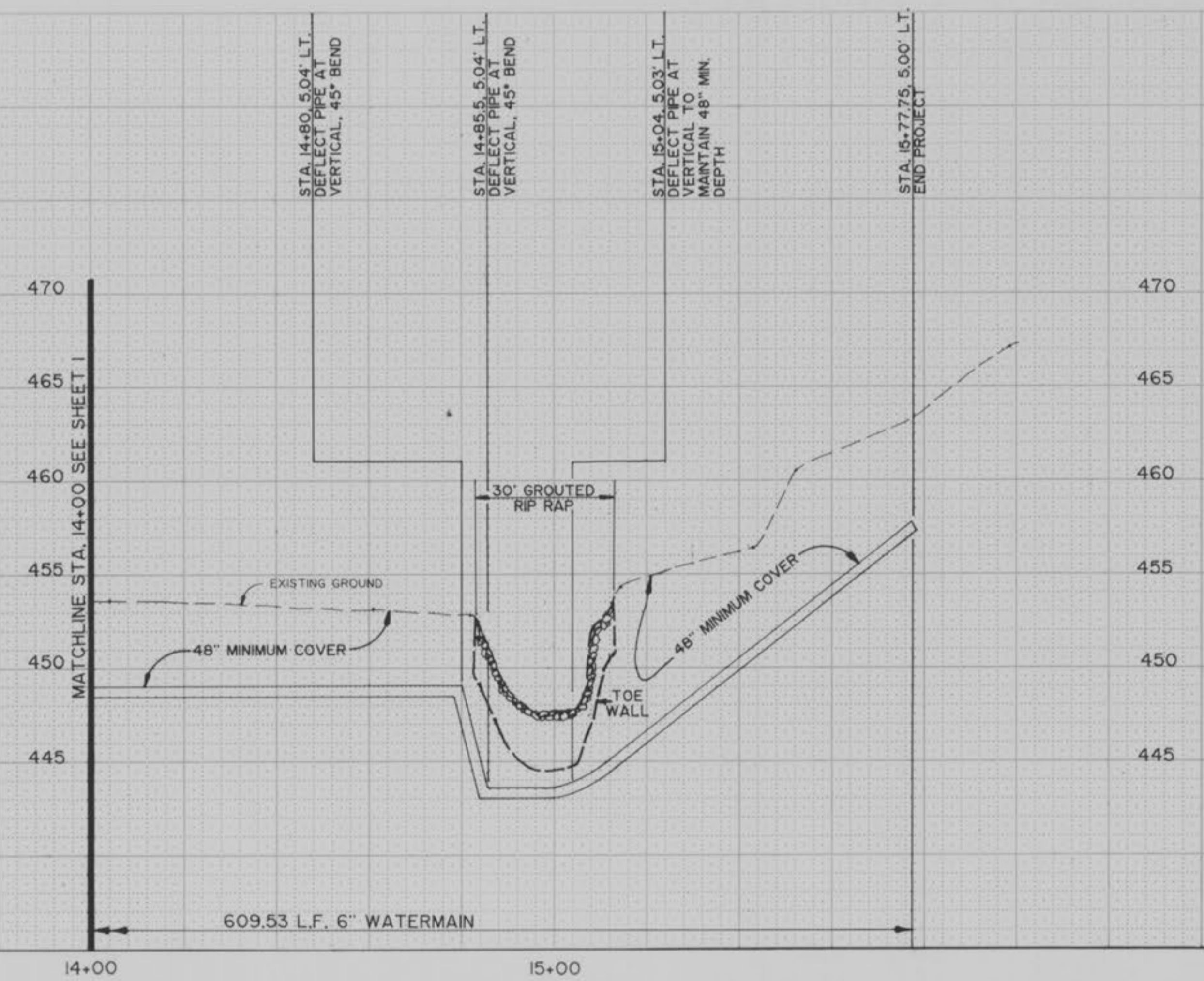


SCALE: 1" = 20'



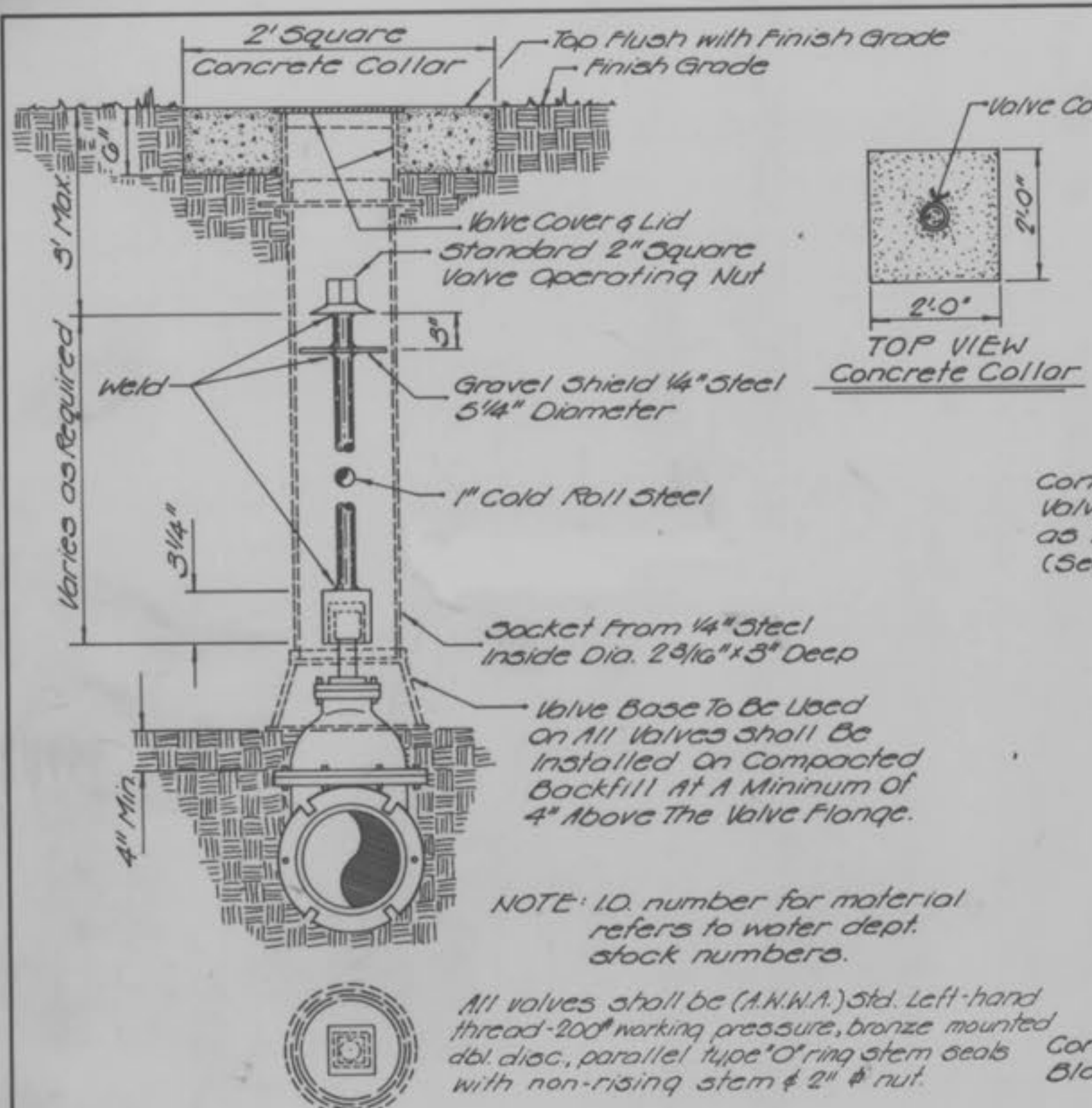
Note: Existing underground and overhead utilities and drainage structures have been plotted from available information and their locations must be considered approximate only. It is the responsibility of the contractor to notify the utility companies and to verify the locations of existing utilities before actual construction begins. Any discrepancies noted must be reported to the Engineer immediately.

UTILITY COMPANY	LINE LOCATION NO.	EMERGENCY NO.
Union Electric	327-6203	327-6203
GTE Telephone Operations	1-800-344-7483	639-3600
Southwestern Bell Telephone	1-800-344-7483	1-800-344-7483
Laclede Gas Company	535-7700	621-6960
TCI Cablevision, Inc.	441-6048	429-3548 947-4705
Cuivre River Electric Co.	1-800-392-3709 411-7410 327-5282	(Same as Line Location)
M.M.E.I. (O'Fallon Water and Sewer)	281-2858	272-3200 (O'Fallon Police)

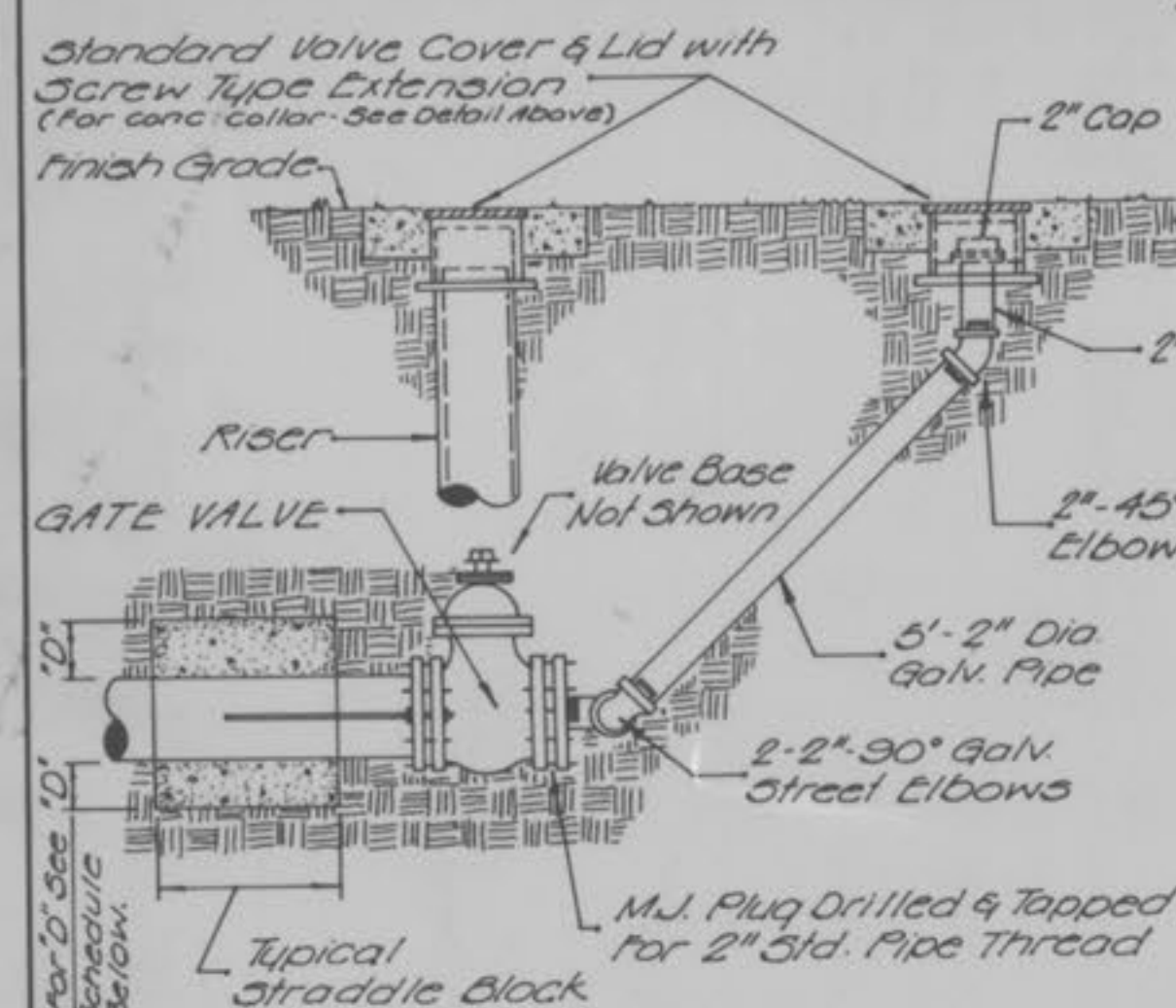


SCALE: 1" = 20' HORIZONTAL
1" = 5' VERTICAL

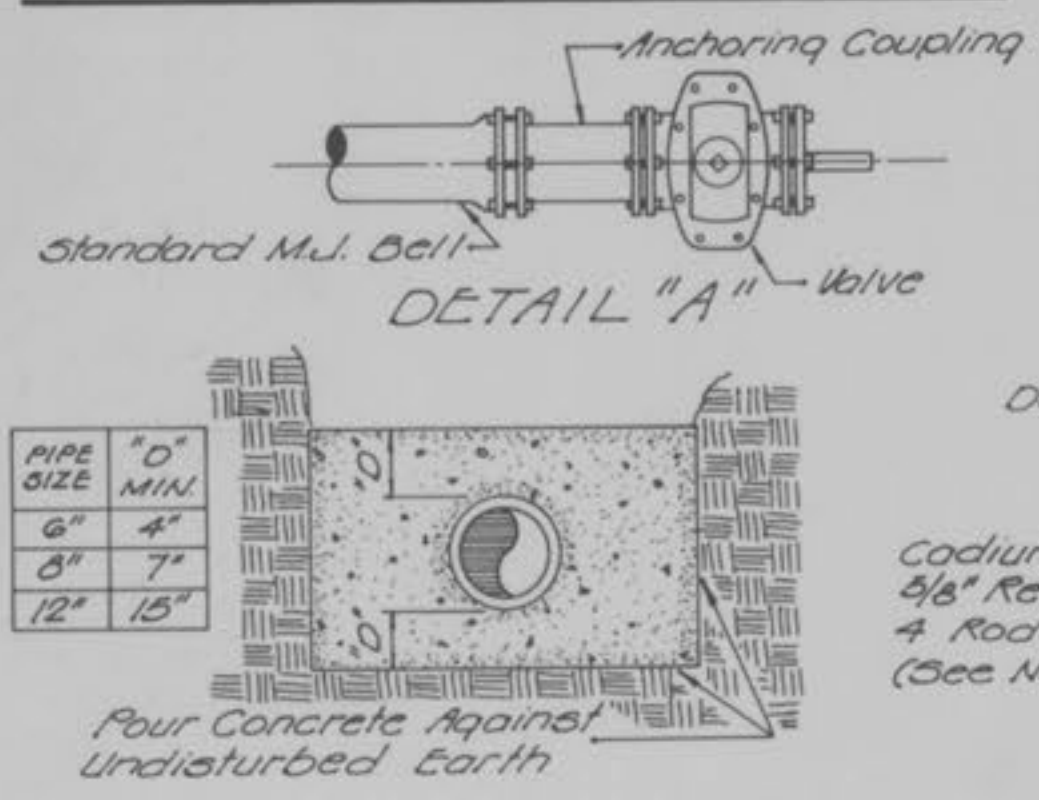
KREIDER WATER MAIN
AS-BUILT



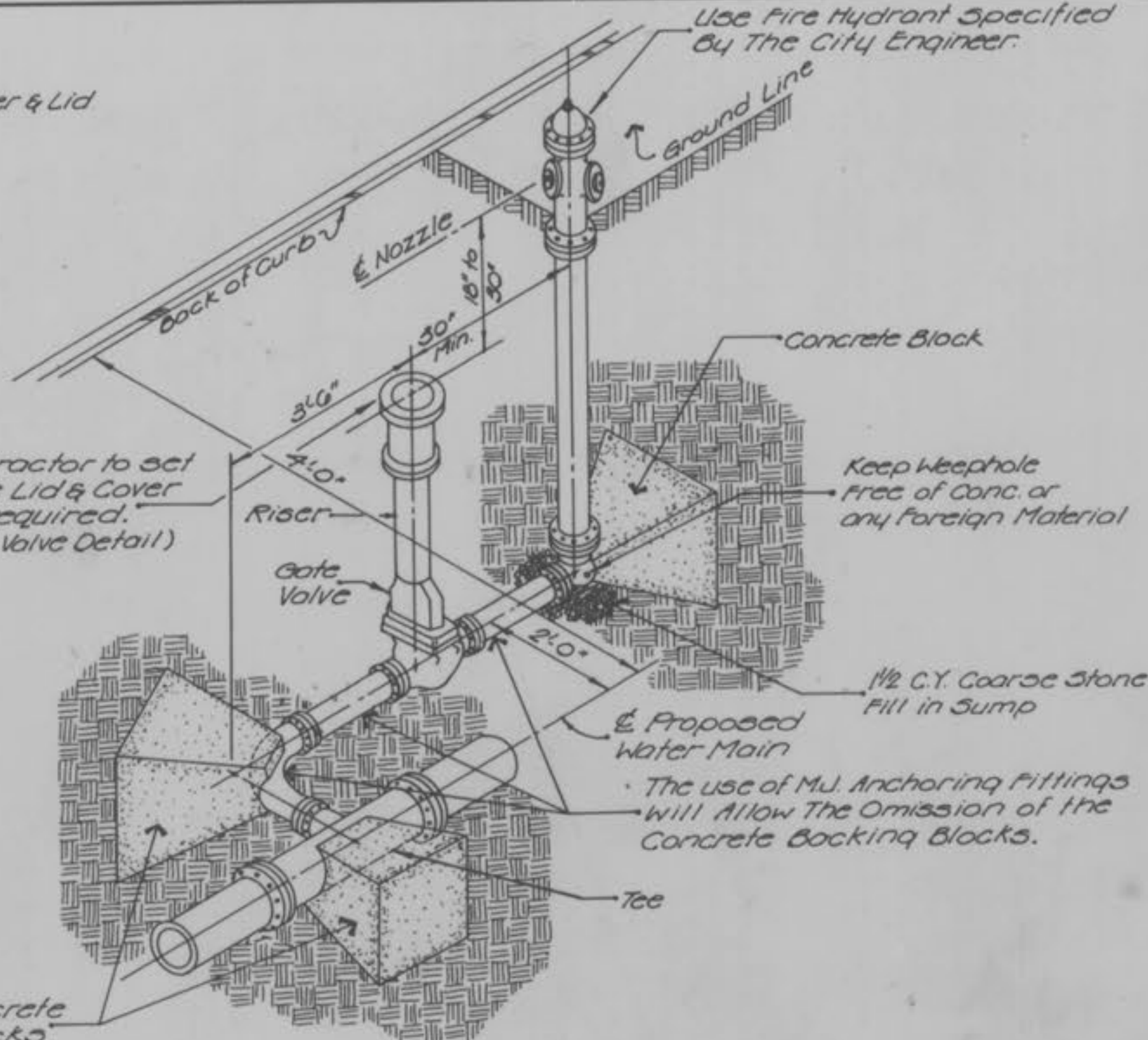
WATER VALVE DETAIL



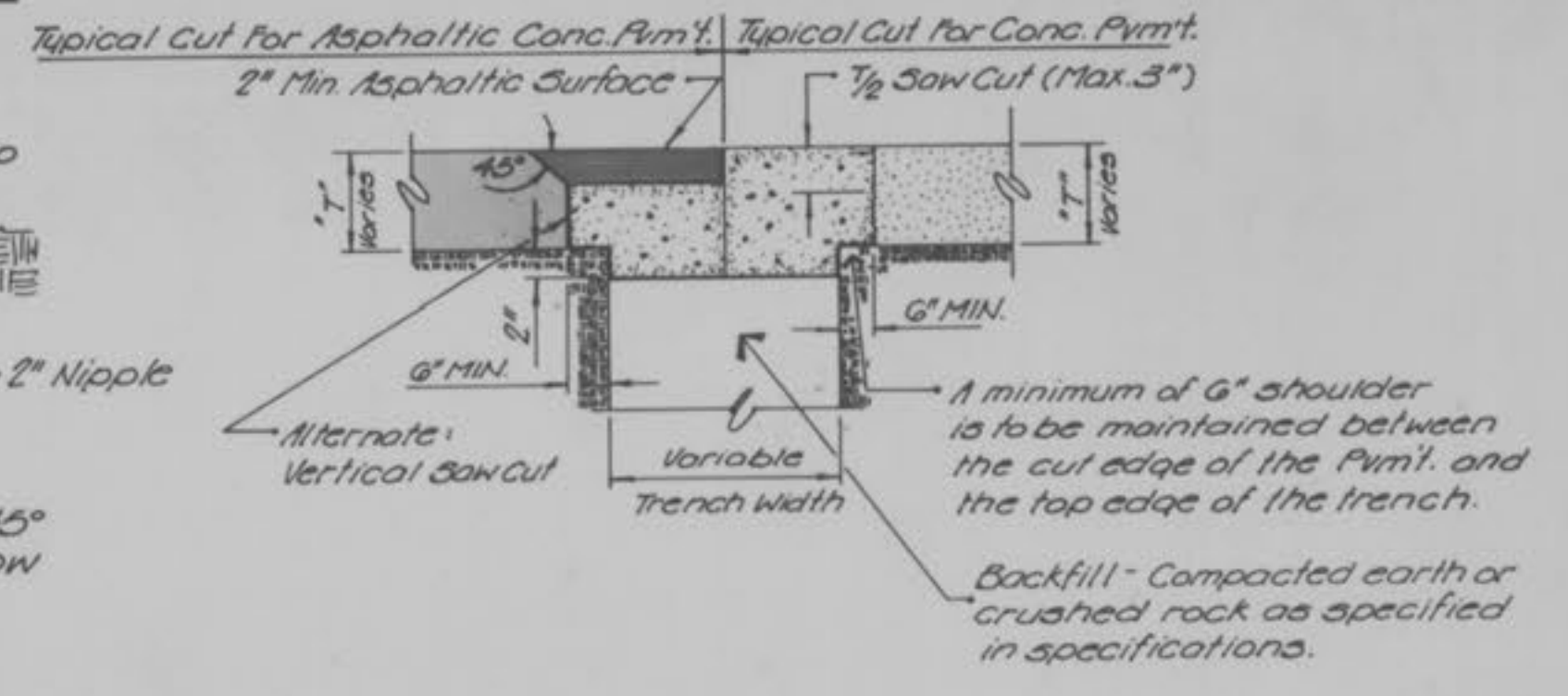
FLUSHING ASSEMBLY



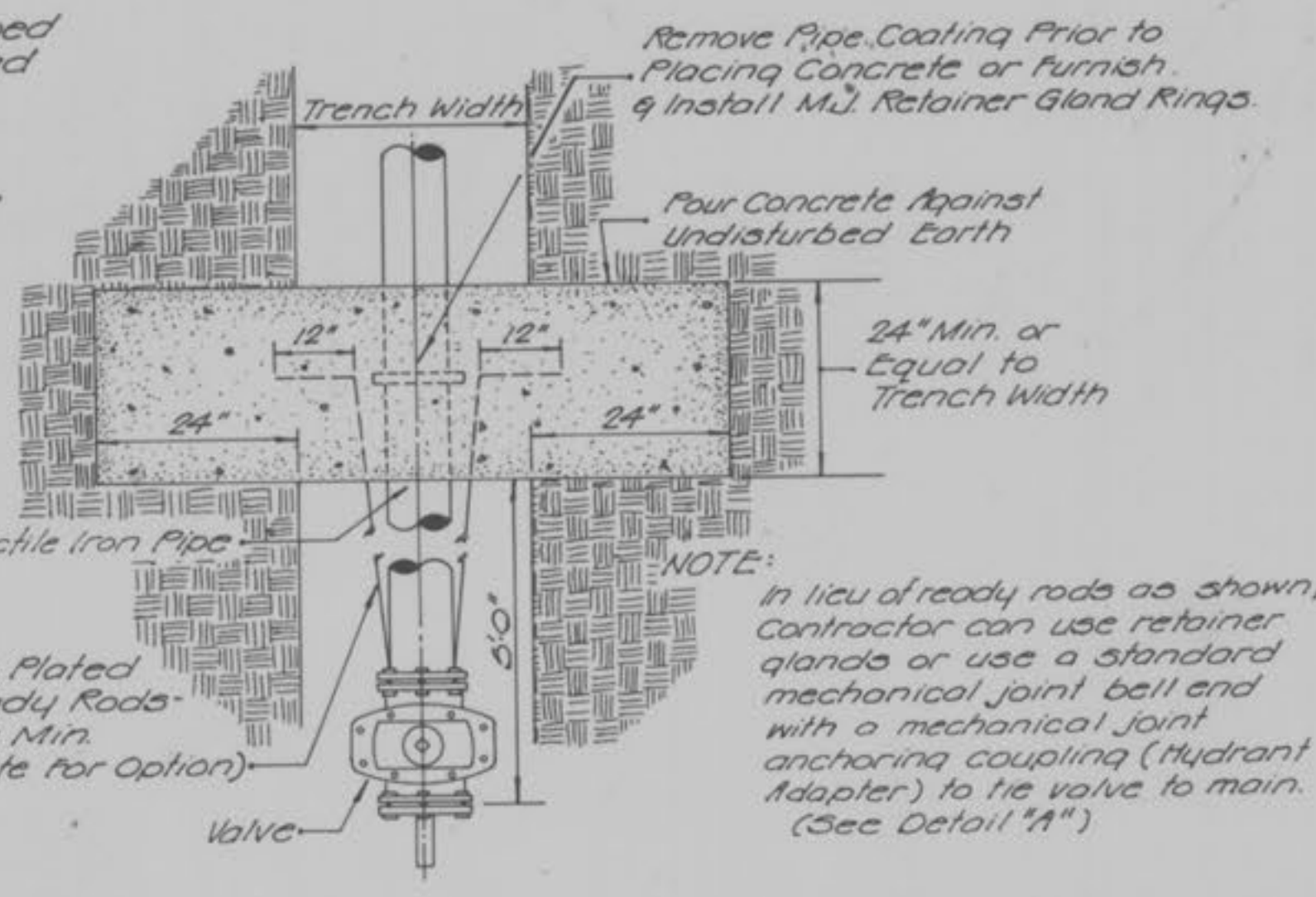
STRADDLE BLOCK DETAIL



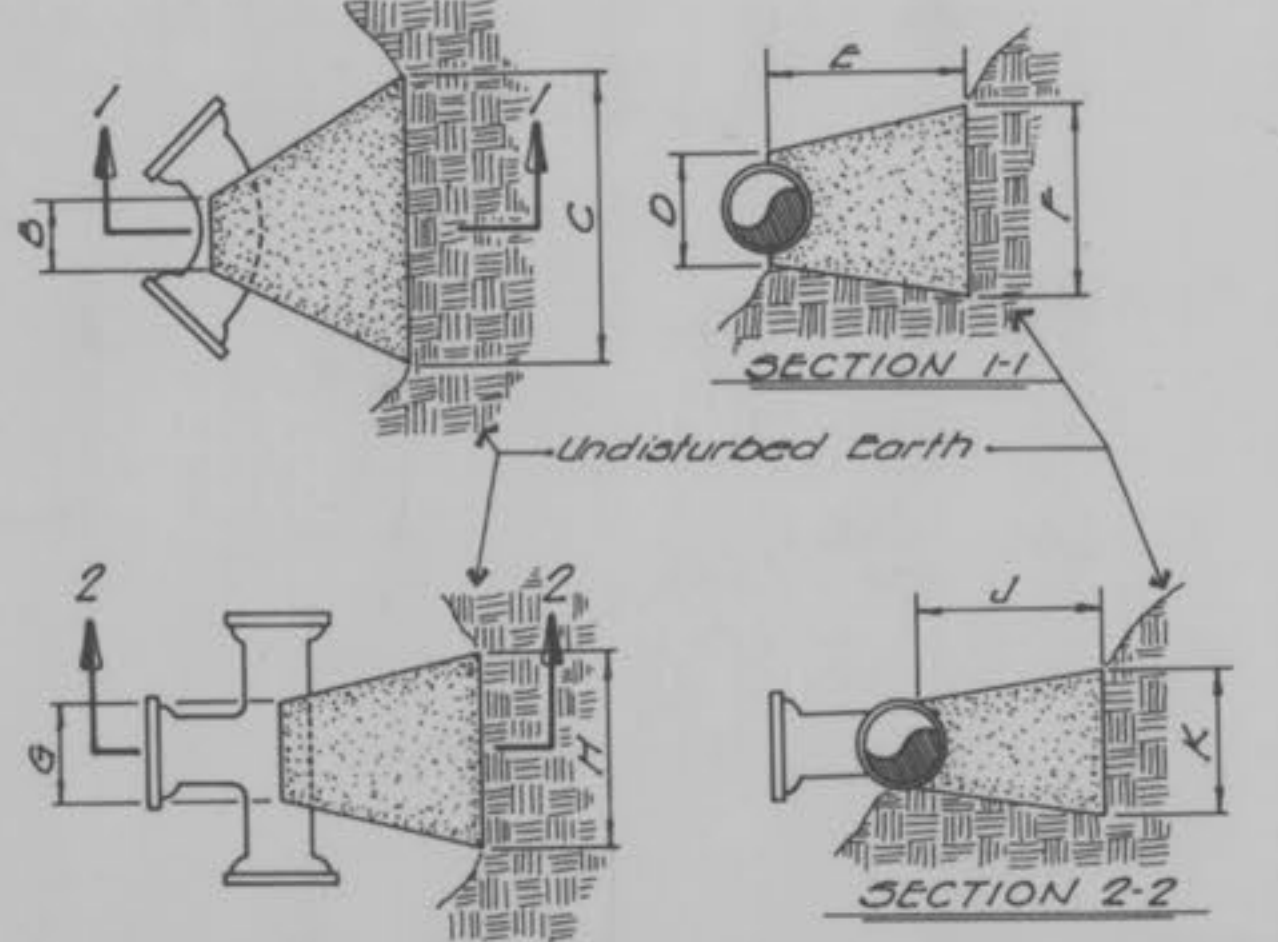
FIRE HYDRANT DETAIL



PAVEMENT REPAIR DETAIL



TUNNEL LINER DETAIL



BENDS	B	C	D	E	F
6\"-11 1/4\"	8\"	15\"	12\"	24\"	10\"
6\"-22 1/2\"	8\"	19\"	12\"	24\"	15\"
6\"-45\"	8\"	30\"	12\"	24\"	14\"
6\"-90\"	8\"	30\"	12\"	24\"	27\"
8\"-11 1/4\"	8\"	20\"	12\"	24\"	10\"
8\"-22 1/2\"	8\"	22\"	12\"	24\"	17\"
8\"-45\"	8\"	30\"	12\"	24\"	24\"
8\"-90\"	8\"	30\"	12\"	24\"	36\"
12\"-11 1/4\"	8\"	30\"	12\"	24\"	15\"
12\"-22 1/2\"	8\"	35\"	12\"	24\"	20\"
12\"-45\"	8\"	40\"	12\"	24\"	40\"
12\"-90\"	8\"	60\"	12\"	24\"	50\"

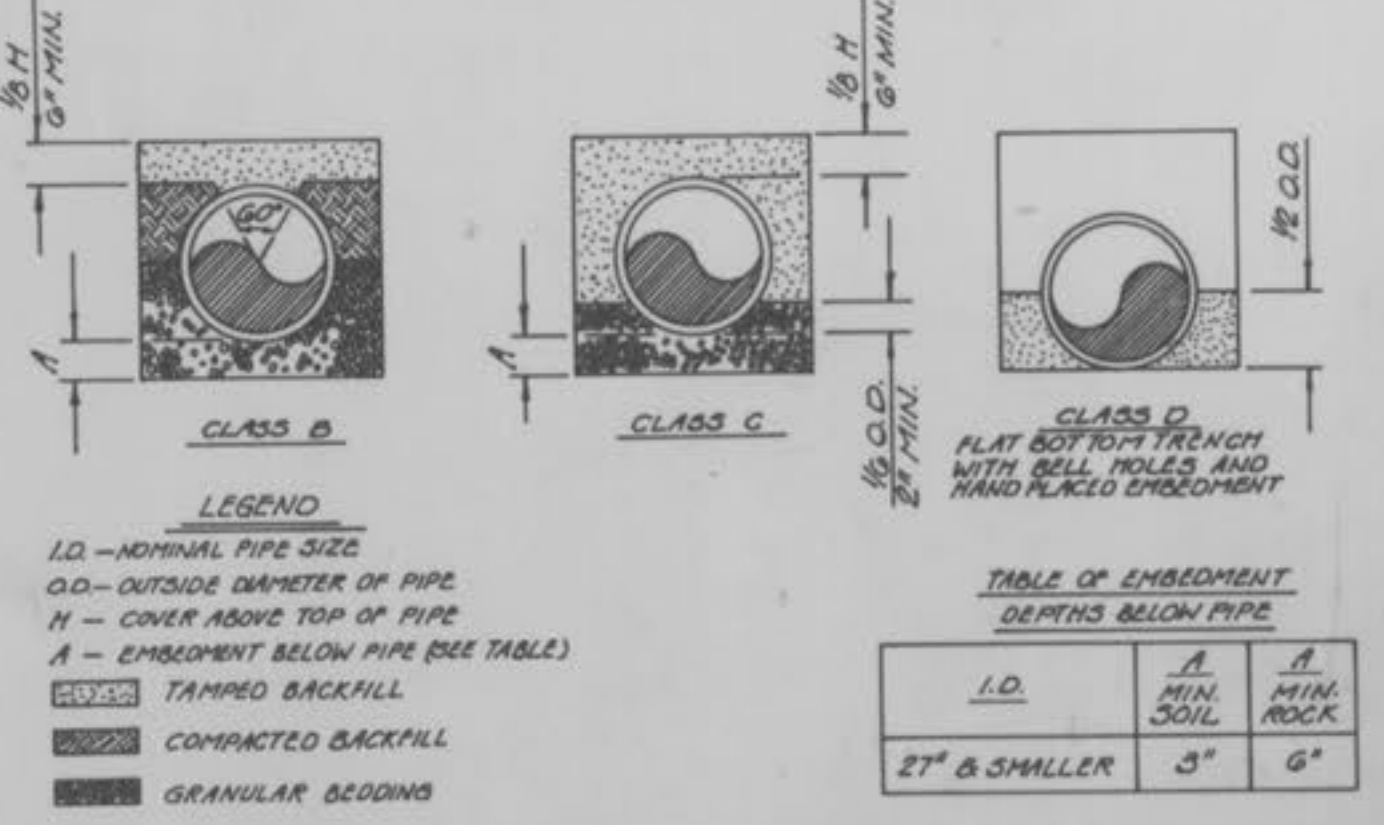
TEES	G	H	J	K
6\"x6\"x6\"	12\"	24\"	24\"	18\"
8\"x8\"x8\"	12\"	24\"	24\"	18\"
8\"x8\"x8\"	12\"	24\"	24\"	24\"
12\"x12\"x12\"	12\"	24\"	24\"	18\"
12\"x12\"x12\"	12\"	30\"	24\"	24\"
12\"x12\"x12\"	12\"	30\"	24\"	30\"

CUBIC FEET OF CONCRETE REQUIRED				
BEND	11 1/4\"	22 1/2\"	45\"	90\"
6\"	1.7	2.4	3.5	5.5
8\"	2.1	3.1	5.0	6.5
12\"	3.7	5.9	9.7	17.5

TEE X				
6\"	8\"	12\"	PLUS	
4.0	~	~	4.0	
4.0	5.0	~	5.0	
4.0	5.5	10.5	10.5	

BACKING BLOCKS

- GENERAL NOTES:**
- All construction shall be done in accordance with the standards set forth by the City and installation shall be done under the supervision of the City Engineer.
 - Watermain Pipe to be 6\" PVC - SDR 21.
 - All fittings shall be mechanical joint, cast iron.
 - All fire hydrants shall have 4\" valve opening, pump nozzle and 2 hose nozzles with 6\" inlet connection, as specified by City Engineer.
 - Bids for fire hydrants shall include 6\" valve and box.
 - Water and sewer main crossings shall conform to the Missouri Clean Water Commission Standards.
 - Trench backfill shall be granular material through street crossings. All trench backfill to be compacted to 95% maximum density.
 - Testing, sterilization and flushing shall be performed to the satisfaction of the City Engineer.
 - All house service connections are to be done in a manner prescribed by the City Engineer.
 - The price for the construction items shall include the cost for labor and materials for installation.
 - All bends, tees and hydrants shall be blocked with concrete per the detail.
 - Price for grouted rip-rap shall include toewalls.
 - Price for watermain shall include all reducers and bends.
 - Contractor to install tracer wire on length of watermain.

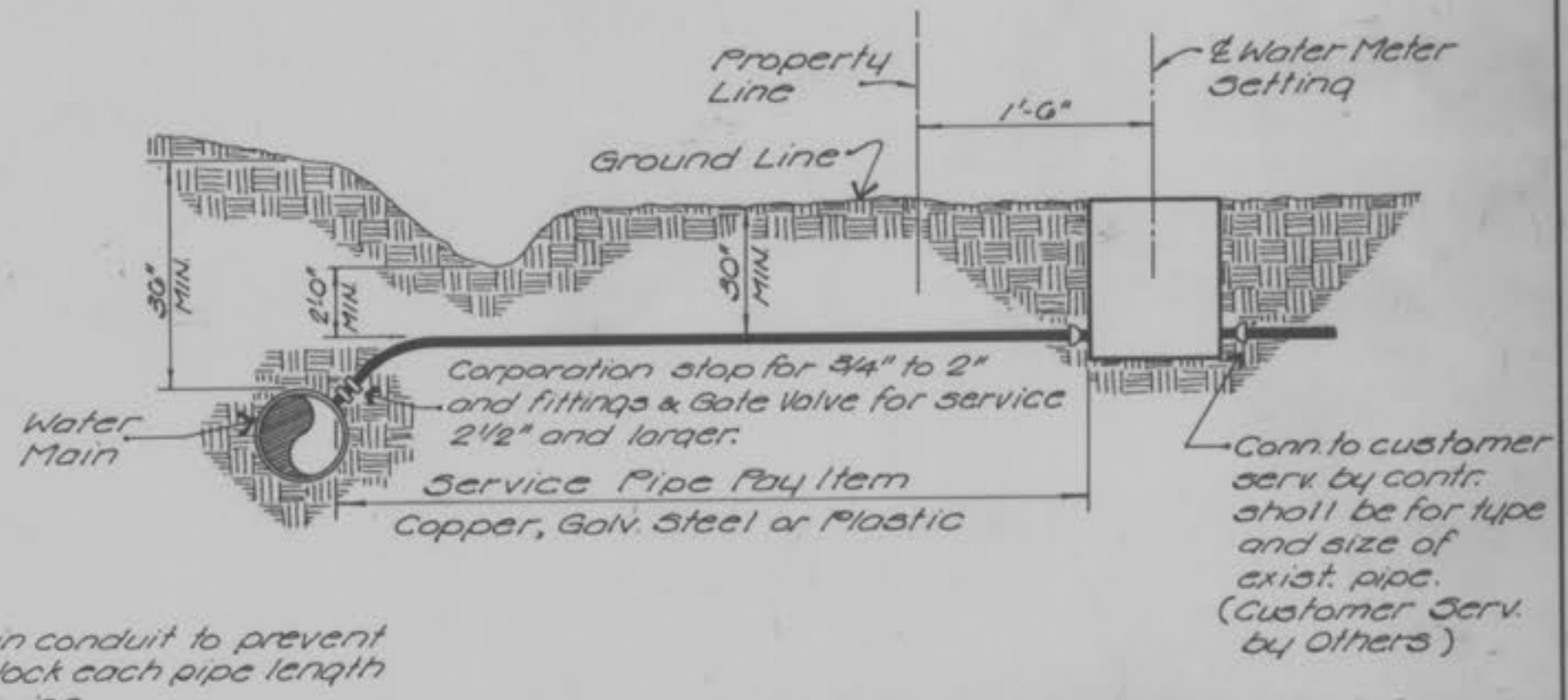


LEGEND
 I.D. - NOMINAL PIPE SIZE
 O.D. - OUTSIDE DIAMETER OF PIPE
 H - COVER ABOVE TOP OF PIPE
 A - EMBEDMENT BELOW PIPE (SEE TABLE)

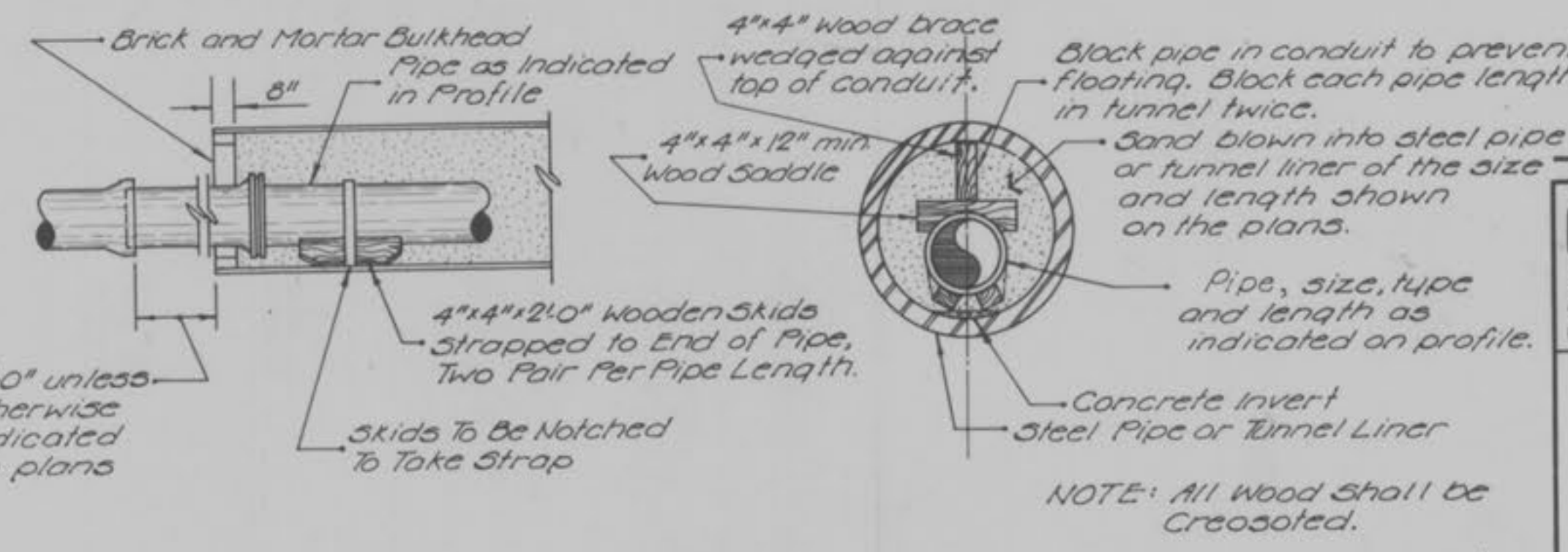
TABLE OF EMBEDMENT DEPTHS BELOW PIPE		
I.D.	A	A
2\" & SMALLER	3\"	6\"

NOTES:
 Granular Bedding shall be crushed rock or pea gravel with not less than 95% passing 1/2\" (95% passing 3/4\" for 30\" and larger pipe) and not less than 95% retained on a #4; to be placed in not more than 6\" layers and compacted by slicing with a shovel or vibrating.
 Compacted Backfill shall be finely divided job excavated material free from debris, organic material and stones, placed in uniform layers not more than 6\" thick and tamped around conduit pipe. Granular backfill material may be substituted for all or part of compacted backfill.
 Tamped Backfill shall be finely divided job excavated material free from debris, organic material and stones, hand placed in uniform layers not more than 8\" thick and tamped around conduit pipe. Granular backfill material may be substituted for all or part of tamped backfill.
 Trench Backfill shall be as required in the "Laying and Backfill" Section of the Detailed Specifications.
 Embedment: The type of embedment to be used shall be as specified in the plans and specifications.

WATER MAIN EMBEDMENT



TYPICAL SERVICE ASSEMBLY



TUNNEL LINER DETAIL

GBA
 GEORGE BUTLER ASSOCIATES
 CONSULTING ENGINEERS/ARCHITECTS
 LANDSCAPE ARCHITECTS/PLANNERS

OFFICES:
 SUITE 300-A FARMWAY OFFICE CENTER
 6210 JENNISON DRIVE / SUMNER MISSOURI / KANSAS 66088
 1100 CITY CENTER SQUARE
 1100 MAIN / KANSAS CITY / MISSOURI 64108
 SUITE 154 LAKESIDE PLAZA W
 6700 CORPORATE DRIVE / KANSAS CITY / MISSOURI 64120

KREIDER WATERMAIN EXTENSION

WATER MAIN DETAILS
 FOR THE
 CITY OF O'FALLON, MISSOURI

DESIGNED BY: **TR. YORD** CHECKED BY: **R.E.H.**

JOB NO. 6934
 DATE 4-16-80
 SCALE NOT TO SCALE
 SHEET NO. 3 OF 3