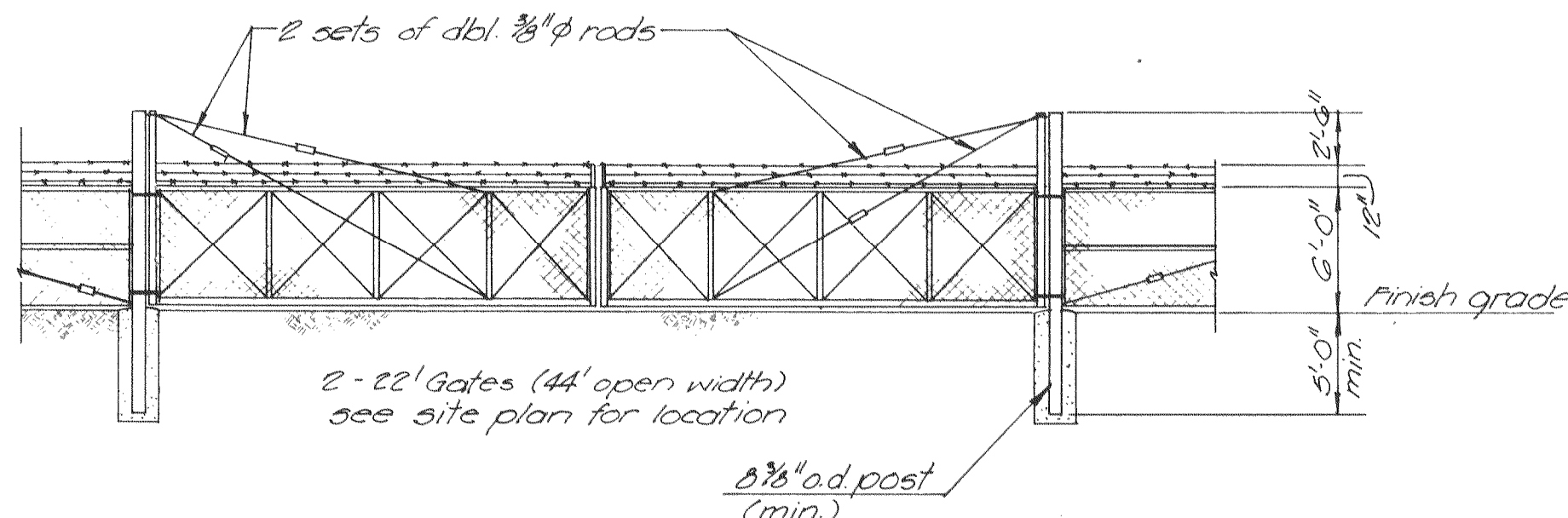
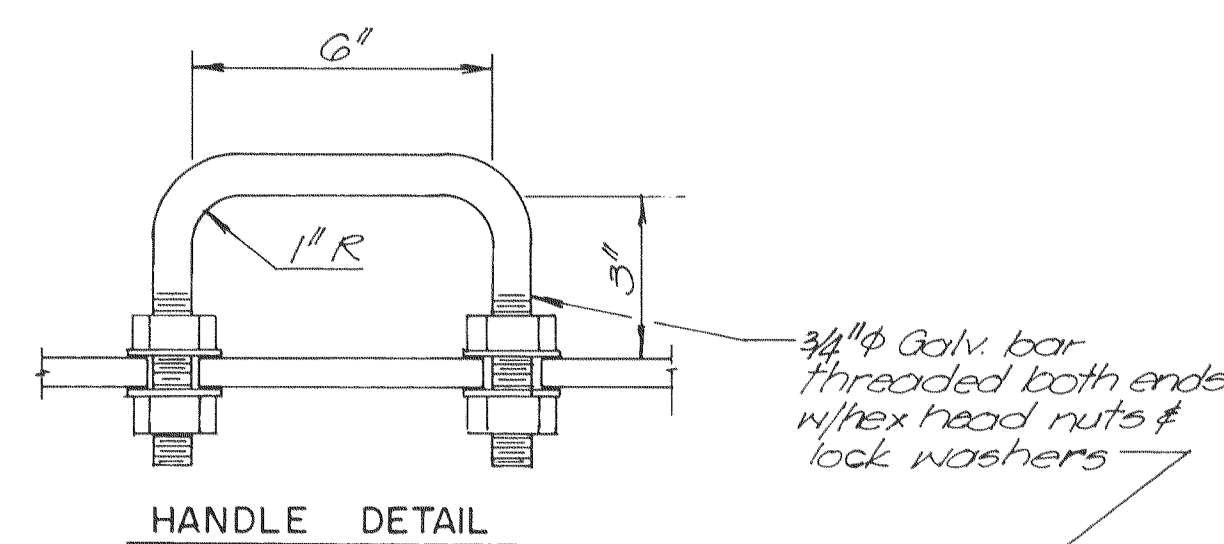


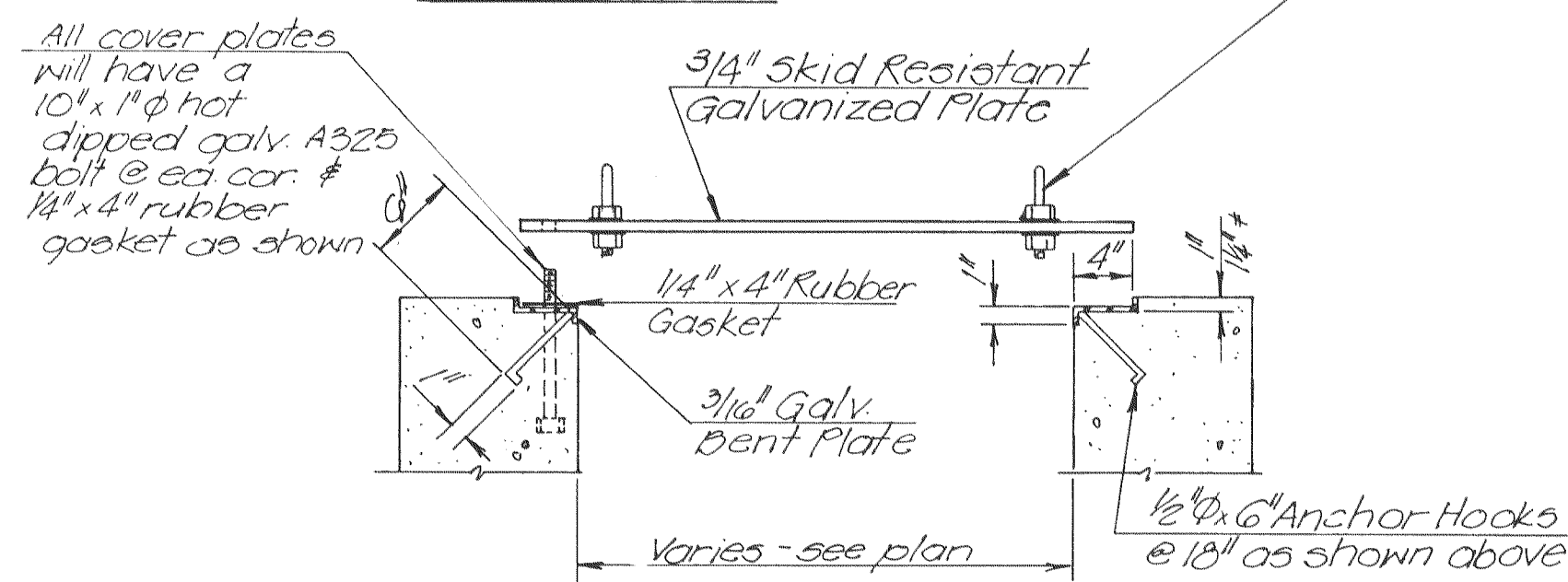
TYPICAL STEEL CHAIN LINK FENCE DETAIL
not to scale



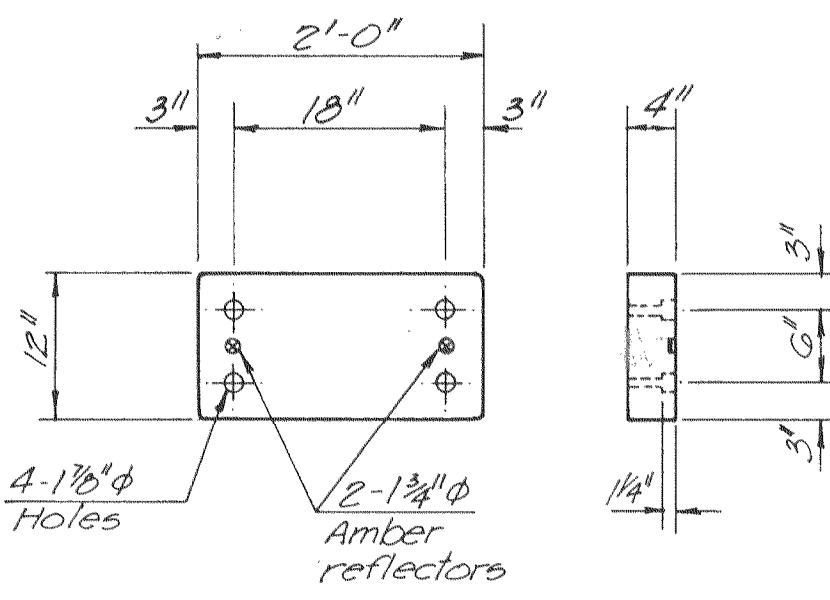
22' GATE DETAIL
not to scale



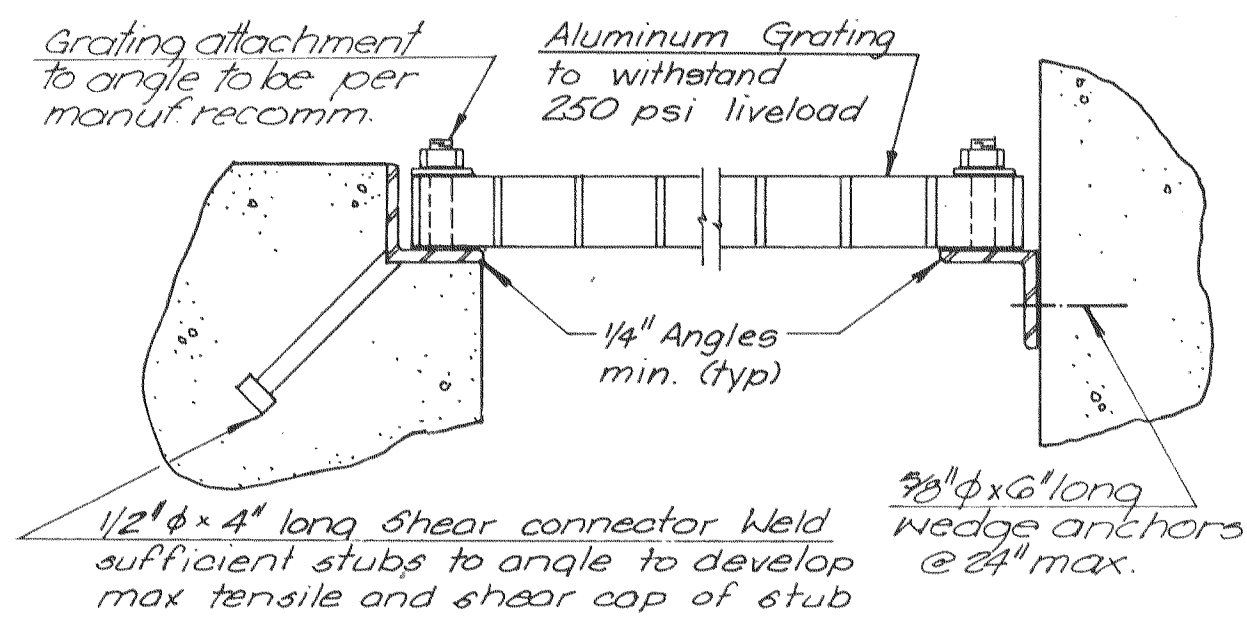
HANDLE DETAIL



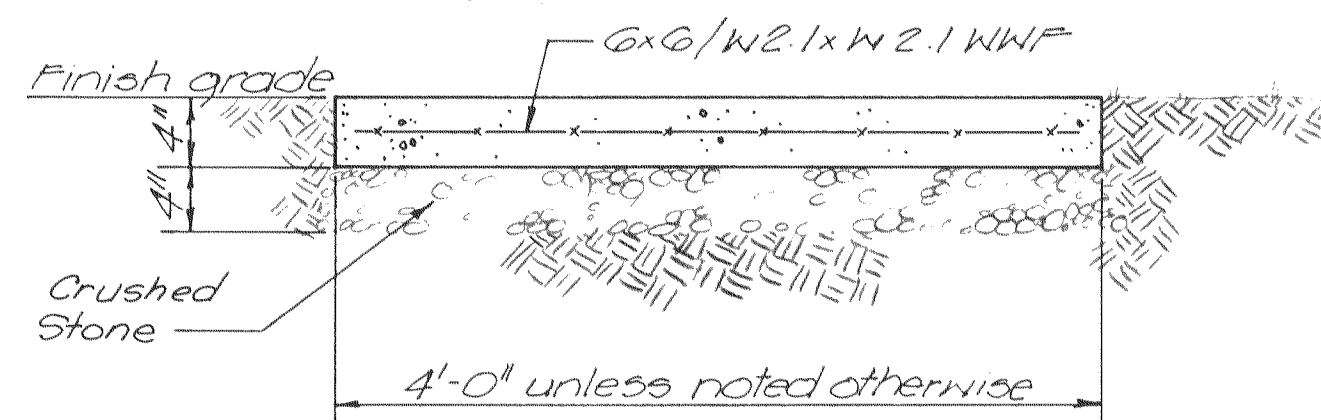
TYPICAL COVER PLATE DETAIL
not to scale



DOCK BUMPER DETAIL
Scale: 3/4" = 1'-0"

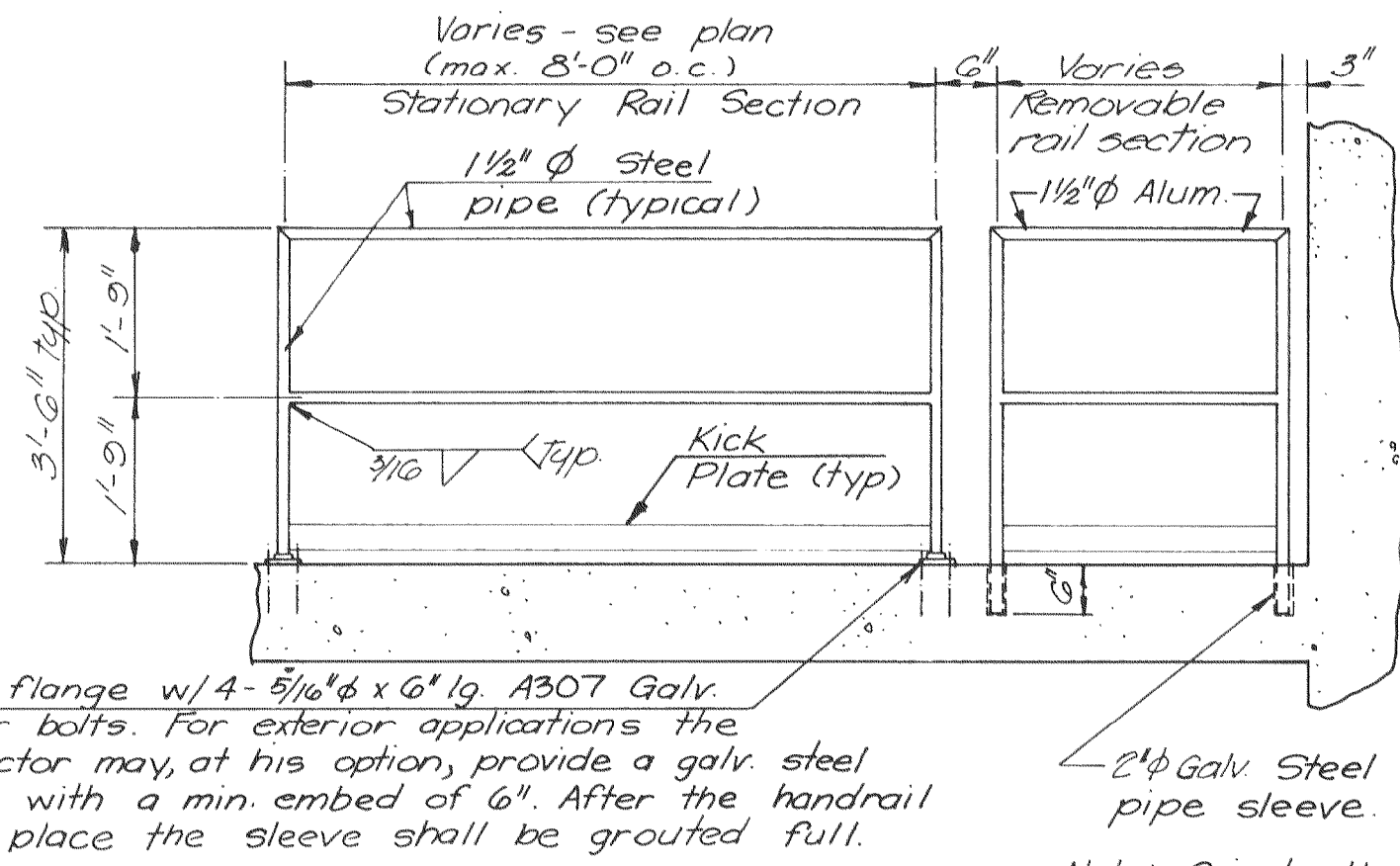


GRATING ATTACHMENT DETAIL



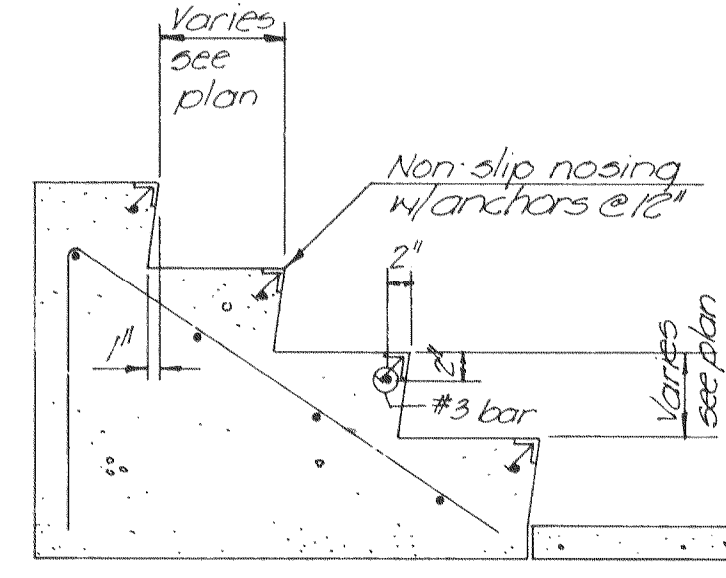
TYPICAL SIDEWALK DETAIL
Scale: 1" = 1'-0"

NOTE 5: 1) Slabs to be poured in maximum lengths of 6'-0" separated by 1/4" expans. joint material.
2) Edges to be tooled, surface to be broom finished.

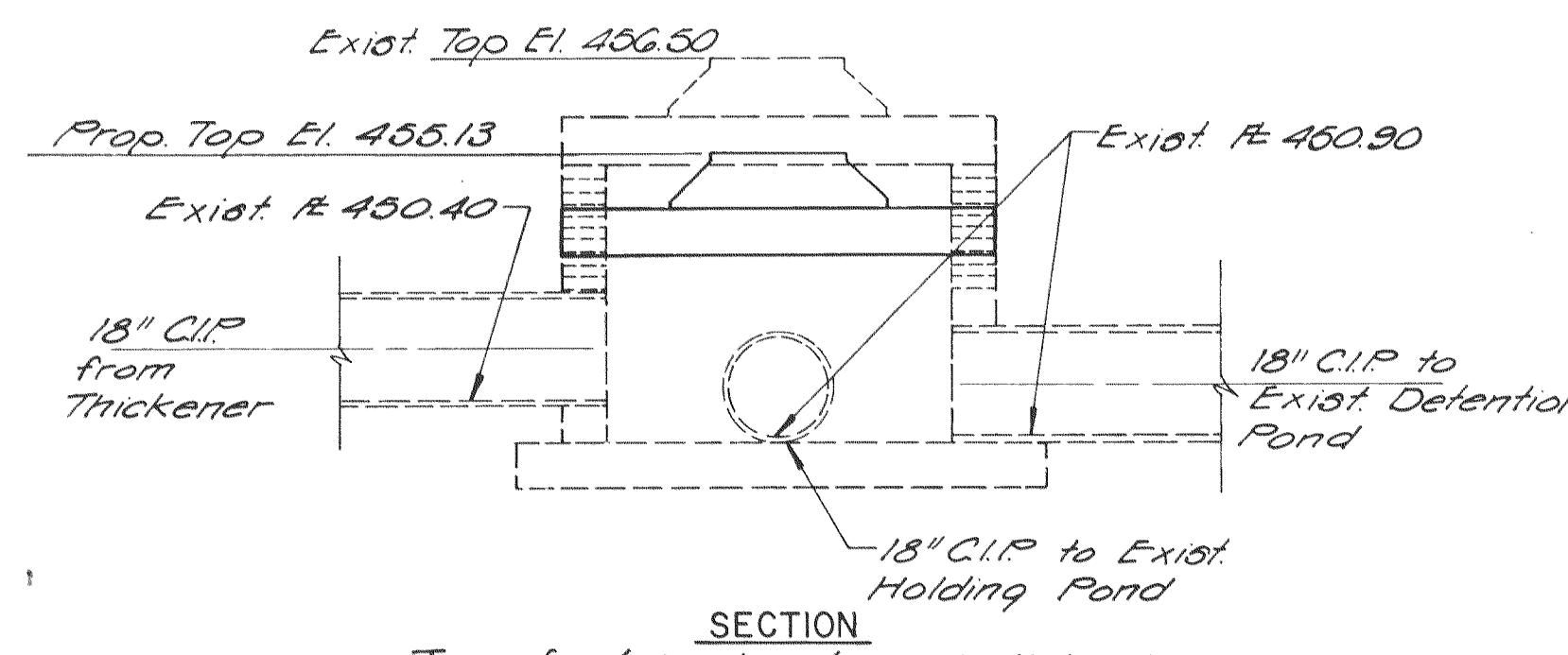
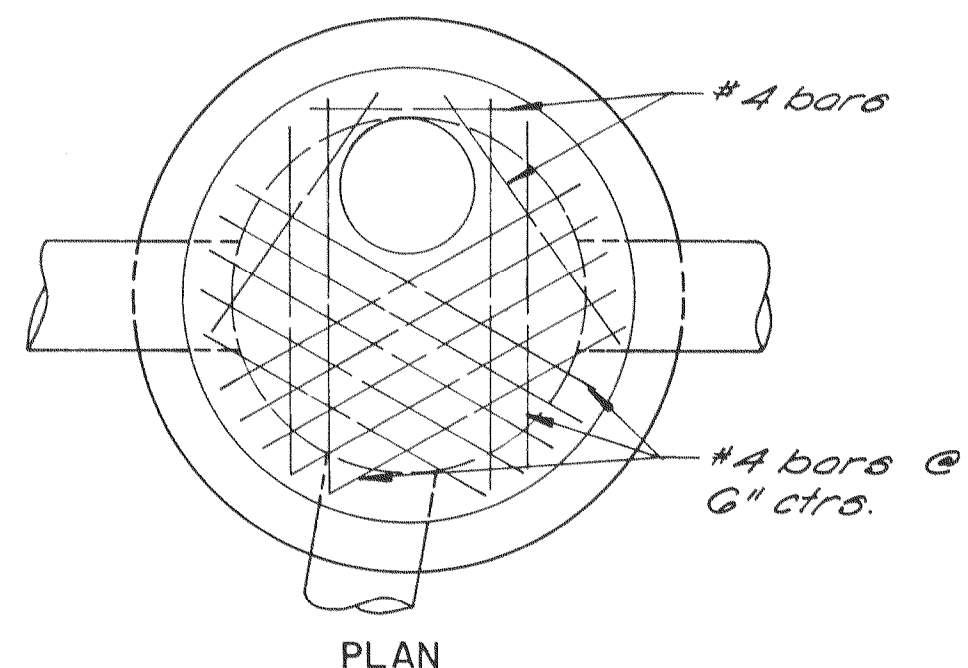


HANDRAIL DETAIL
Scale: 1/2" = 1'-0"

Floor flange w/ 4-5/16" x 6" lg. A307 Galv. anchor bolts. For exterior applications the Contractor may, at his option, provide a galv. steel sleeve with a min. embed of 6". After the handrail is in place the sleeve shall be grouted full.



EXTERIOR CONCRETE STEPS DETAIL
not to scale



Top of slab elevation shall be lowered as shown. The top slab and the manhole ring and cover may be removed and reused provided they remain undamaged. Any portion of the manhole that is damaged during const. shall be removed and restored to its original condition.

MANHOLE ADJUSTMENT DETAIL
Scale: 3/8" = 1'-0"

THRUST BLOCKING

All fittings on pressure or normally surcharged piping shall be restrained by concrete blocking in accordance with the following requirements or by a system of restrained joints approved by the Engineer.

For bends in which the resultant thrust is horizontal or downward, the area of undisturbed trench backing for thrust blocks shall be in accordance with the following formula:

$$\frac{\text{Sq. Ft. of undisturbed Trench Backing}}{\text{Pressure condition}} = \frac{\text{Safe bearing load of soil (2000 lb/sq.ft.)}}{\text{Pressure condition} \times 1.5 \times \text{coefficient}}$$

The coefficients shall be in accordance with the following:

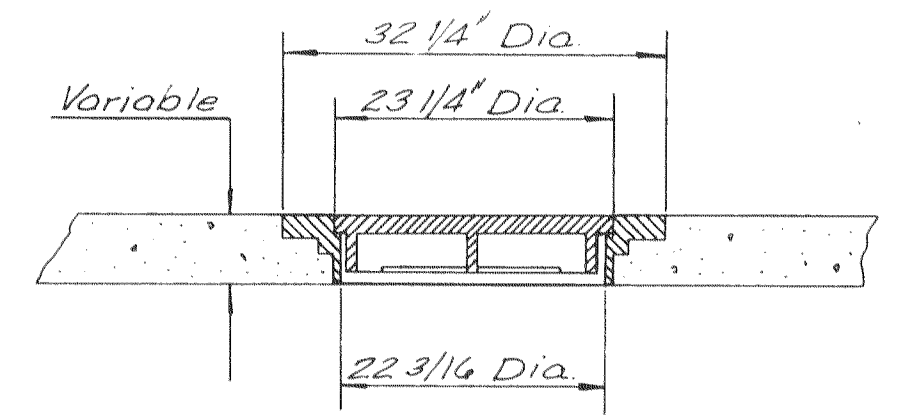
PIPE SIZE	DEAD END OR TEE	90° BEND	45° BEND	22 1/2° BEND	11 1/4° BEND
2	4	5	3	2	1
3	7	10	6	3	2
4	13	18	10	5	3
6	21	40	22	11	6
8	59	84	39	20	10
10	79	112	61	31	16
12	112	160	87	45	23
14	154	219	119	61	31
16	200	285	155	79	40
18	253	361	196	100	51
20	313	446	242	123	62
22	378	539	292	149	75
24	450	642	348	177	90

The Pressure Conditions shall be as follows:

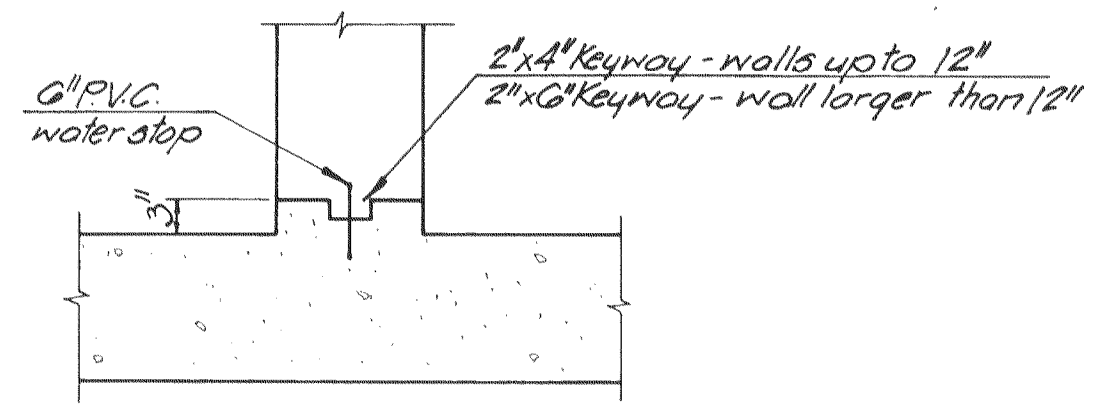
- 1) Potable water lines 150 psi
- 2) Digested sludge discharge 350 psi
- 3) All other pressure or surcharged lines 50 psi

RESTRAINED JOINTS CHART

(To replace the thrust block due to the fill.)



TYPICAL MANHOLE IN SLAB DETAIL
not to scale



CONSTRUCTION JOINT DETAIL
not to scale

EPA PROJECT NO. C291090

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

OFFICES:
SUITE 305-A FAIRWAY OFFICE CENTER
4210 JOHNSON DRIVE / SHAWNEE MISSION / KANSAS 66205
1100 CITY CENTER SQUARE
1100 MAIN / KANSAS CITY / MISSOURI 64105
SUITE 134 LAKESIDE PLAZA II
6700 CORPORATE DRIVE / KANSAS CITY / MISSOURI 64120

WASTEWATER TREATMENT PLANT EXPANSION
MISCELLANEOUS SITE DETAILS

CITY OF O'FALLON, MISSOURI
DESIGNED BY: WCC/JLS DRAWN BY: C. RAYG CHECKED BY: W.A.C.

Rev. 3-82 MKK
JOB NO. 79-2065
DATE July 30, 1981
SCALE As shown
SHEET 66 OF 88