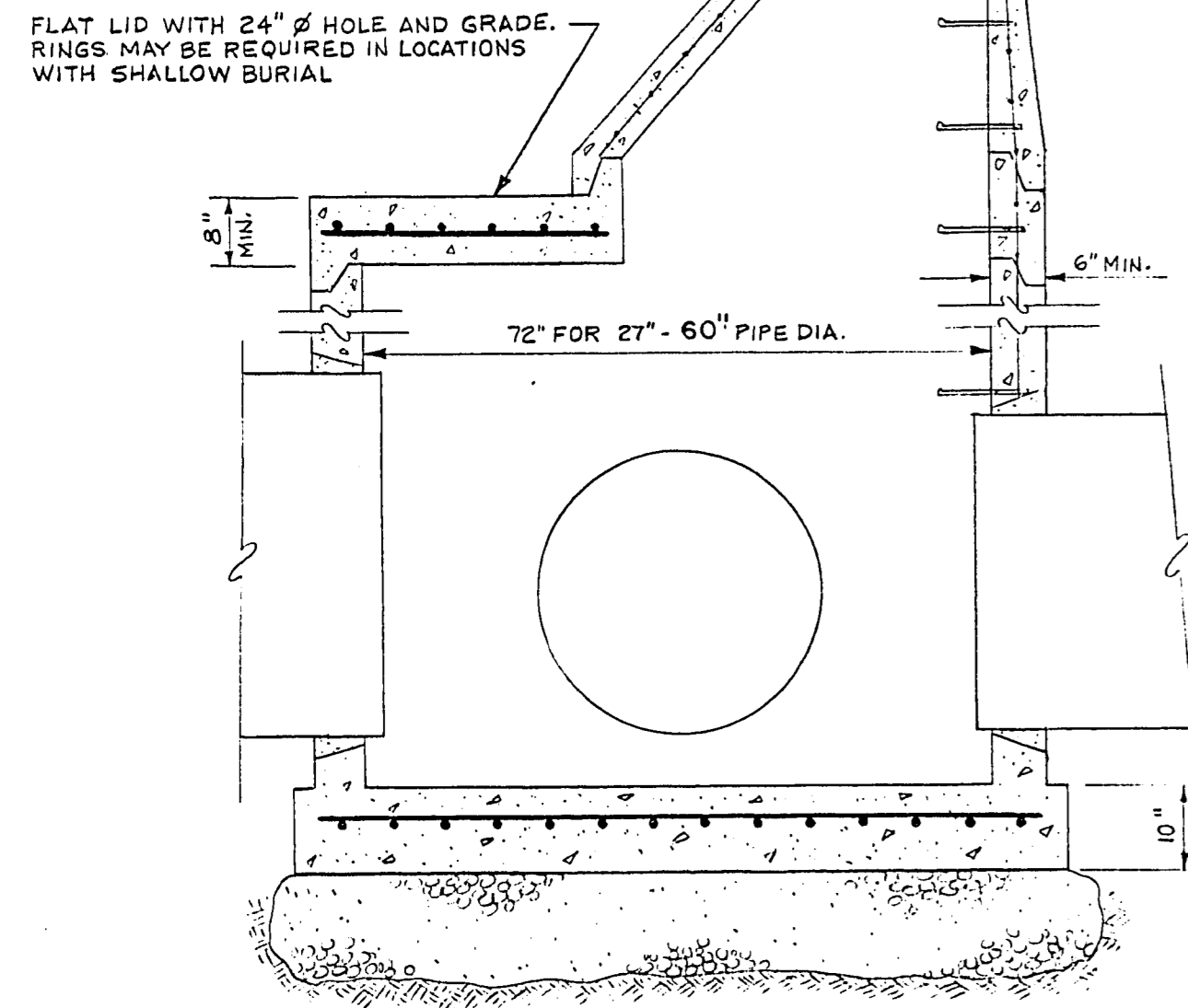
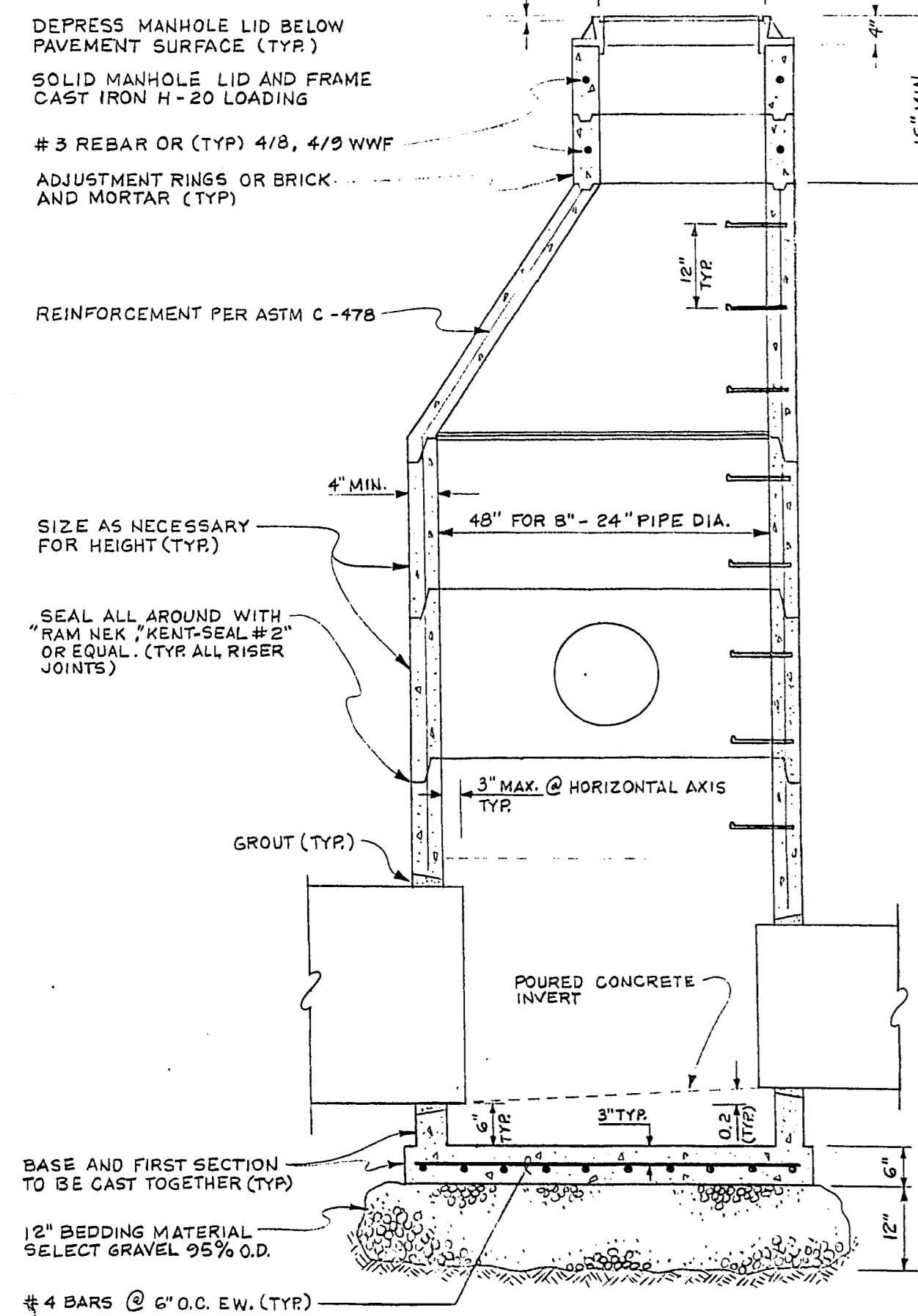


**GENERAL NOTES**

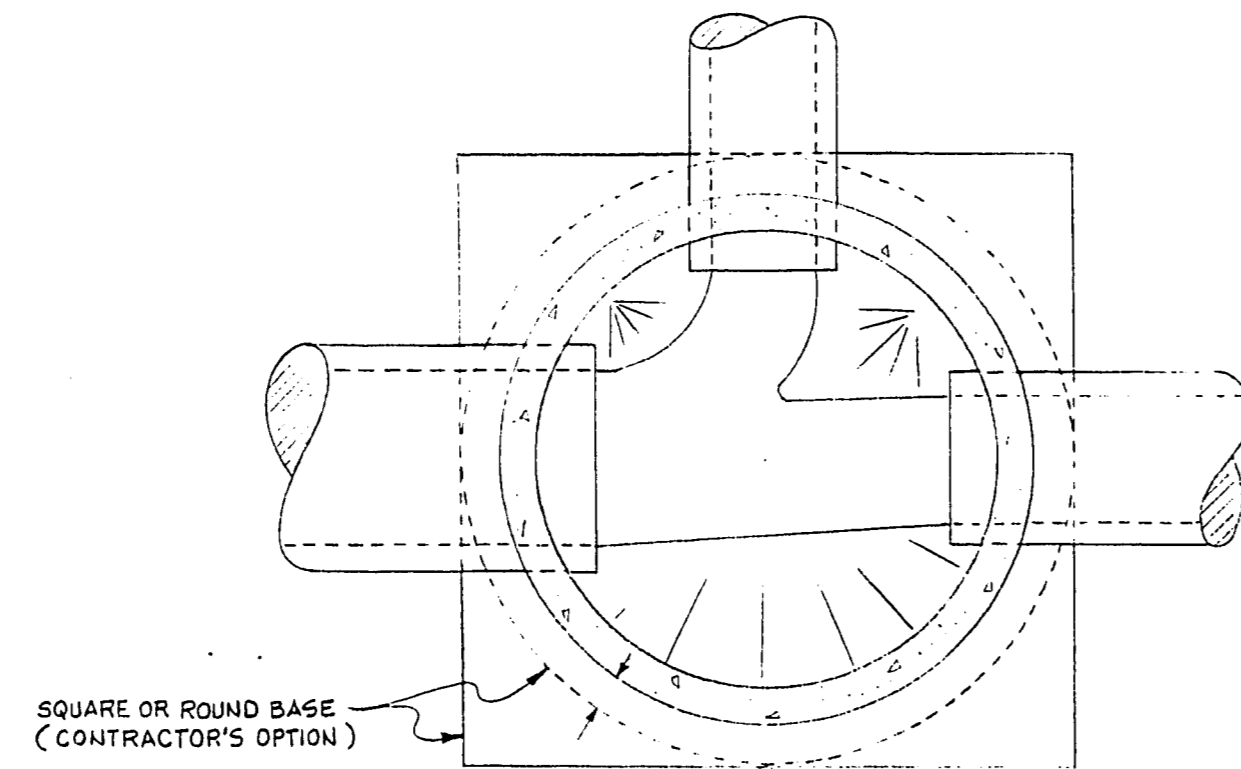
1. Manhole materials and construction shall conform to the requirements of Section 609, "Manholes, Catch Basins and Inlets".
2. Concrete shall be Class D or DA.
3. Cement shall be Type V.
4. Steel reinforcement shall be in accordance with the latest revision of ASTM C-478/AASHTO M-199.
5. Riser joints shall be sealed with "Ram Nek", "Kent-Seal #2" or approved equal flexible butyl rubber.
6. Openings to receive pipe shall be circular, tapered toward the inside of the manhole and shall be of minimum size to accommodate pipe.
7. All grout shall be a non-shrink type.
8. Pipe shall not protrude more than three inches (3") into manhole at the horizontal axis of the pipe and shall be cut off square.
9. Manhole section lengths shall be arranged to accommodate lateral connections and to fit the depth required.
10. Optional two piece 24" to 48" and 48" to 60" cones may be used for larger diameter manholes.
11. The distance from the top of manhole cone to the first step shall be a maximum of sixteen inches (16").
12. All steps shall be aluminum or polypropylene plastic reinforced with No. 4 deformed steel rod.
13. Excavation shall be as nearly vertical as possible with a minimum clearance of eighteen inches (18") between the outside face of the manhole and the excavated material. All backfill will be mechanically compacted to 95% O.D.
14. Slope of storm drain laterals is  $S = .02$  unless shown otherwise on the plans.
15. MANHOLE TEE SECTIONS MAYBE USED WHERE THERE ARE NO DROP INLET LATERALS AT MANHOLES.



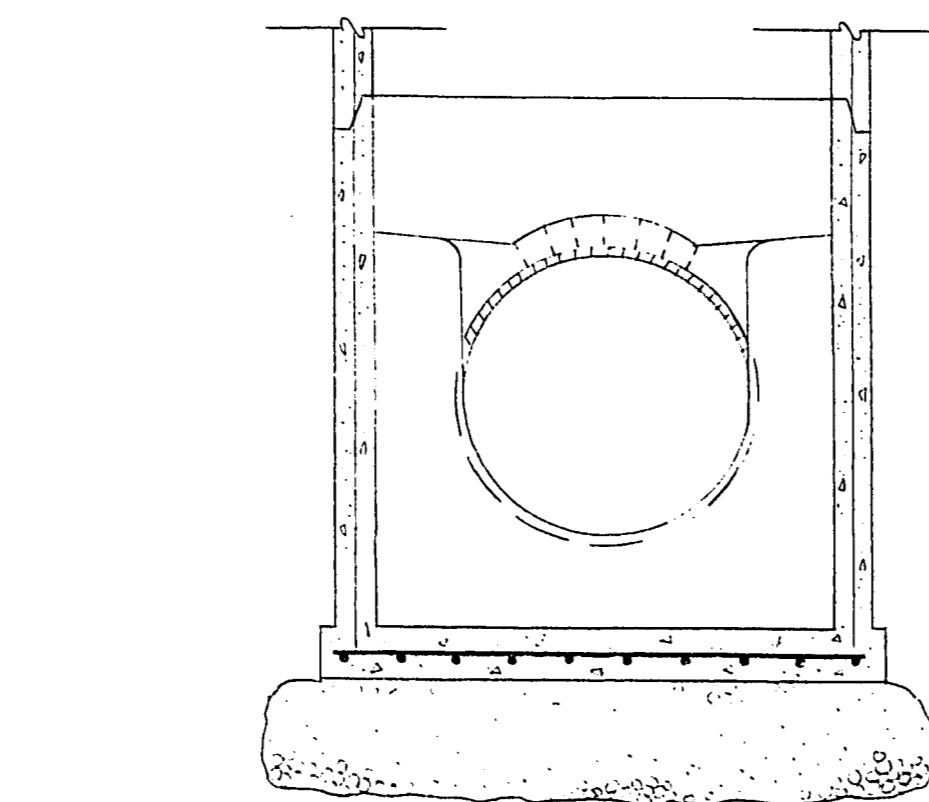
**72" TYPE II MANHOLE**



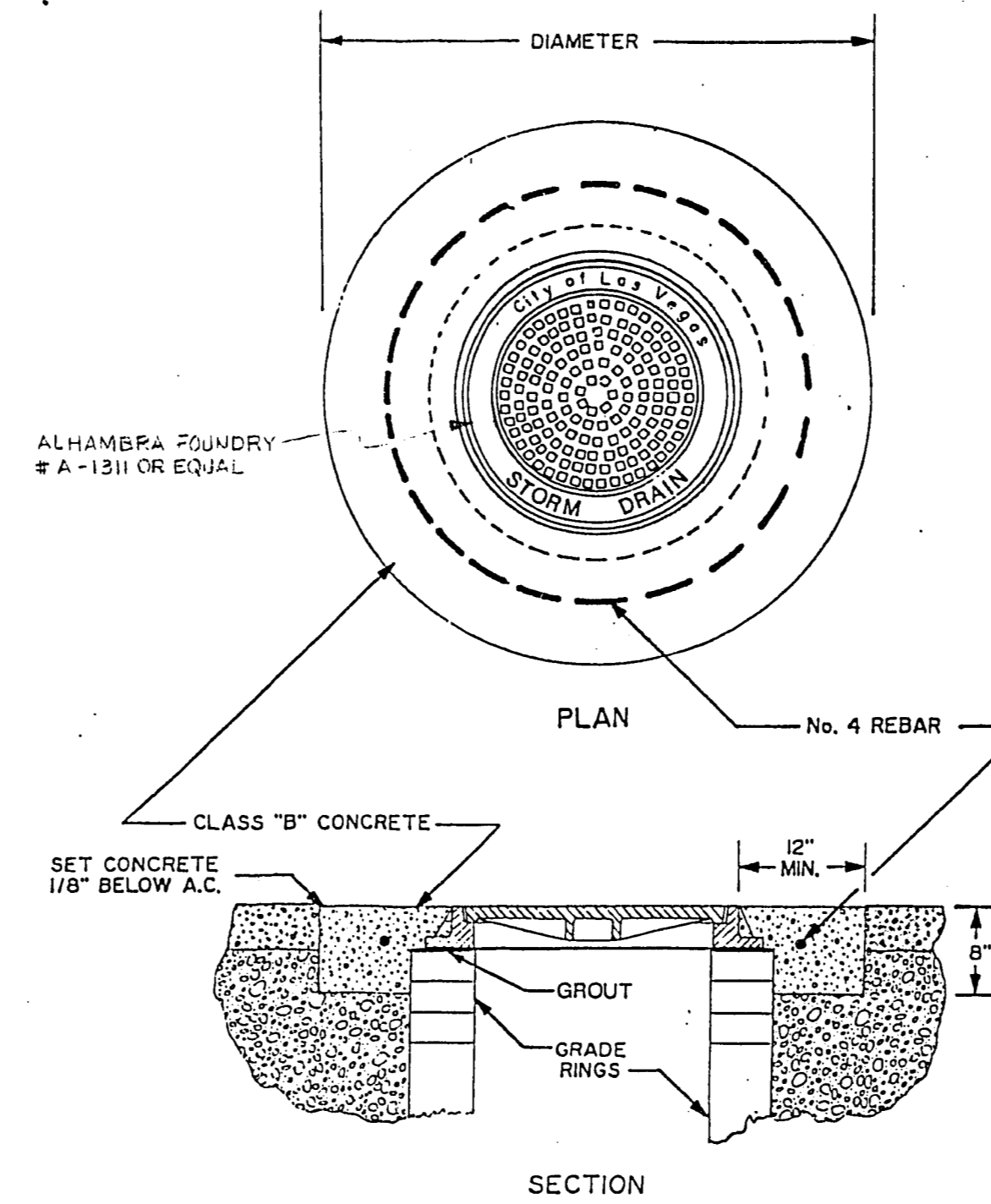
**48" TYPE I MANHOLE**



**"T" SECTION PLAN VIEW**

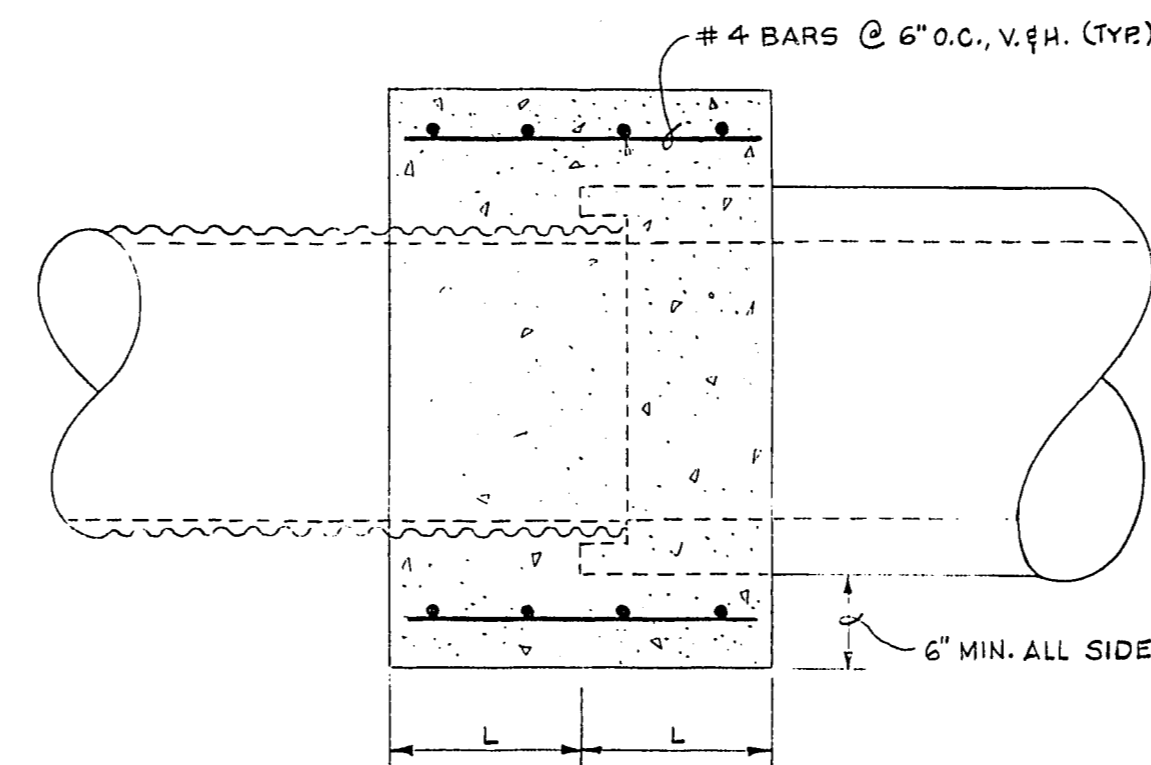


**A TYPICAL CONCRETE MANHOLES**

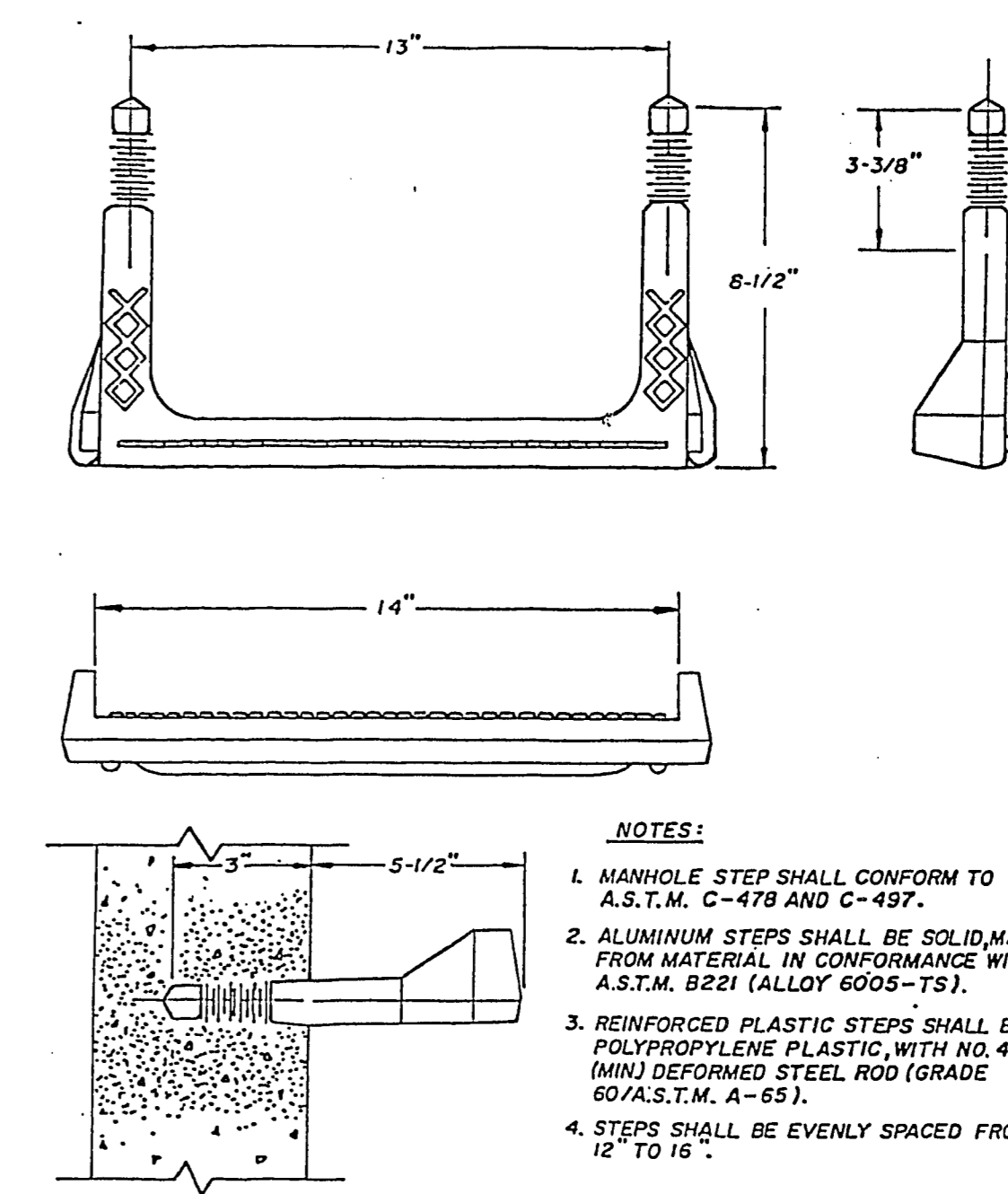


**B CONCRETE COLLAR AROUND MANHOLE**

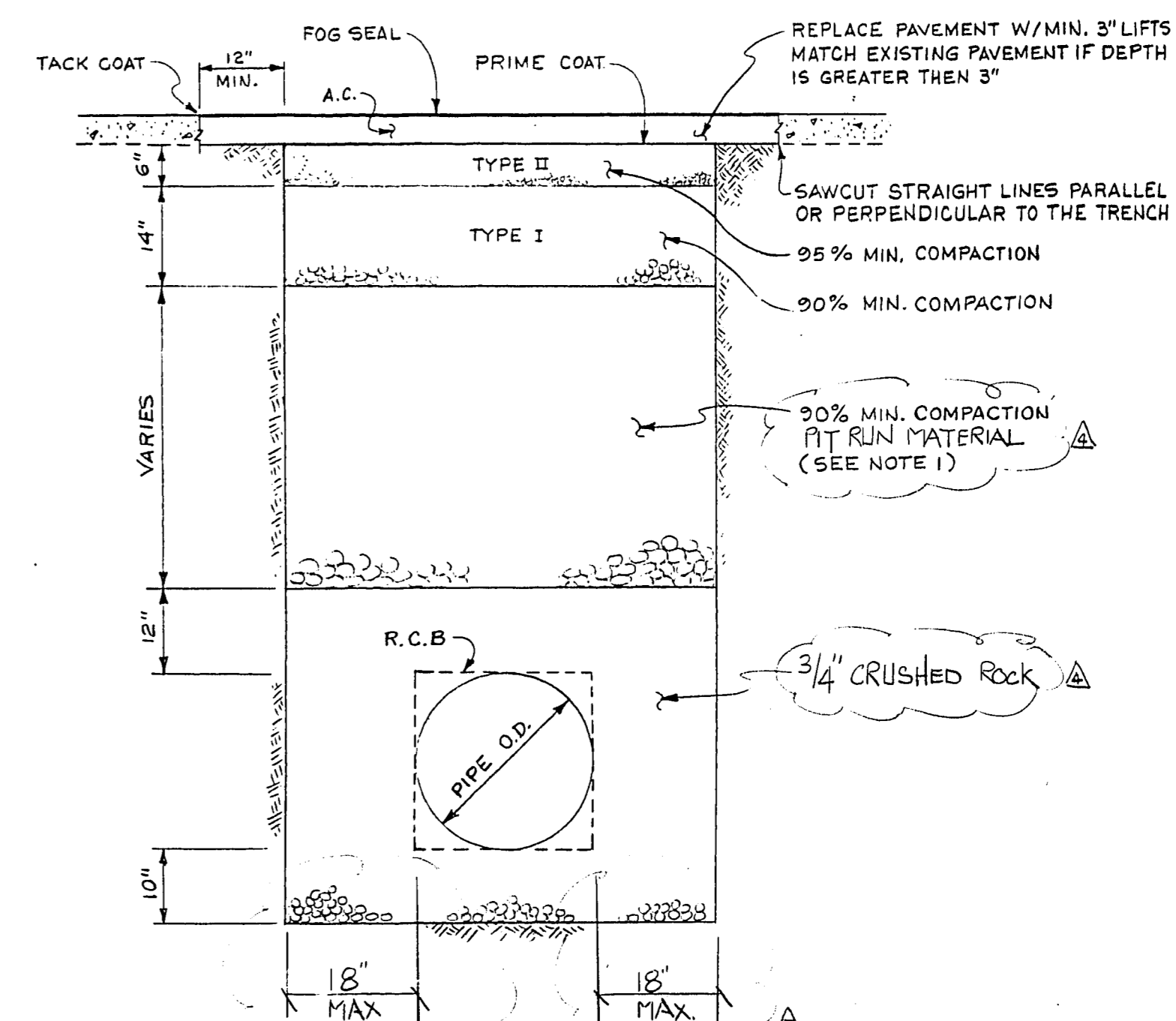
- NOTES:
1. A CONCRETE COLLAR IS REQUIRED AT JOINTS OF DISSIMILAR PIPE MATERIALS
  2. A CONCRETE COLLAR IS REQUIRED WHERE THE CHANGE IN ALIGNMENT EXCEEDS ORDINARY JOINT ALLOWANCE
  3. L = 12" FOR PIPES 24" OR LESS, 18" FOR PIPE 27" AND LARGER



**D CONCRETE PIPE COLLAR**



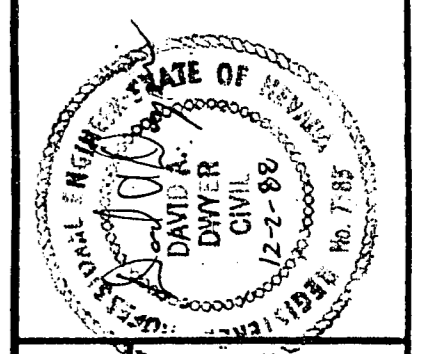
**C MANHOLE STEPS DETAIL**



- NOTES:
1. NO STONES OR LUMPS GREATER THAN 3" PERMITTED IN TRENCH 2' OR LESS IN WIDTH
  2. IF SAWCUT IS WITHIN THREE FEET OF EDGE OF EXISTING ASPHALT CONCRETE SURFACE OR OTHER PATCH REMOVE EXISTING PAVEMENT TO THAT EDGE AND REPLACE ENTIRE SECTION
  3. MECHANICAL COMPACTION IN LIFTS NOT TO EXCEED 10" IS REQUIRED IN ALL ZONES. COMPACTION BY PONDING AND JETTING IS NOT PERMITTED

**E STORM DRAIN TRENCH DETAIL**

Scale (h)	Scale (v)	W.A. W.06410								
Fid. bk. no.	Date DEC. 1988	Drawn by NORRMA GOMEZ								
Design by DAVID A. DWYER	Date	Approved by CITY ENGINEER								
<table border="1"> <tr> <th>Revisions</th> <th>Date</th> </tr> <tr> <td>1</td> <td>7/14/87</td> </tr> <tr> <td>2</td> <td>7/12/87</td> </tr> <tr> <td>3</td> <td>6/27/87</td> </tr> </table>		Revisions	Date	1	7/14/87	2	7/12/87	3	6/27/87	
Revisions	Date									
1	7/14/87									
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Department of Public Works Engineering Design Division  
**STORM DRAIN DETAILS**  
 MANHOLES, TRENCH BACKFILL

**OWENS AVENUE**  
 (PECOS ROAD TO NELLIS BLVD.)

