COUNTY SANITATION DISTRICTS OF LOS ANGELES COUNTY
OFFICE OF CHIEF ENGINEER

STANDARD DRAWINGS FOR CONSTRUCTION

APPROVED Stephen R. Maguin

STEPHEN R. MAGUIN
CHIEF ENGINEER - C. E. No. 23089

LIST OF DRAWINGS

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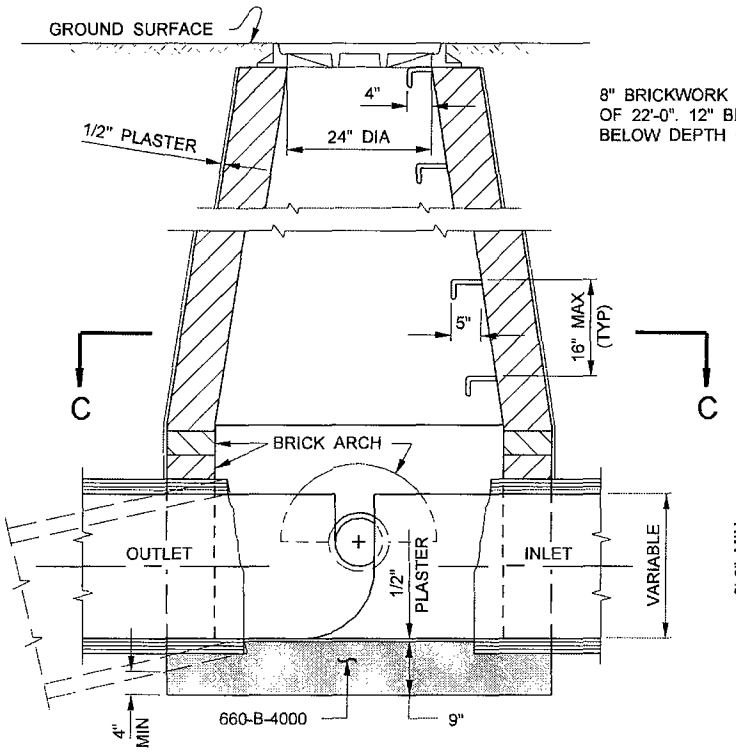
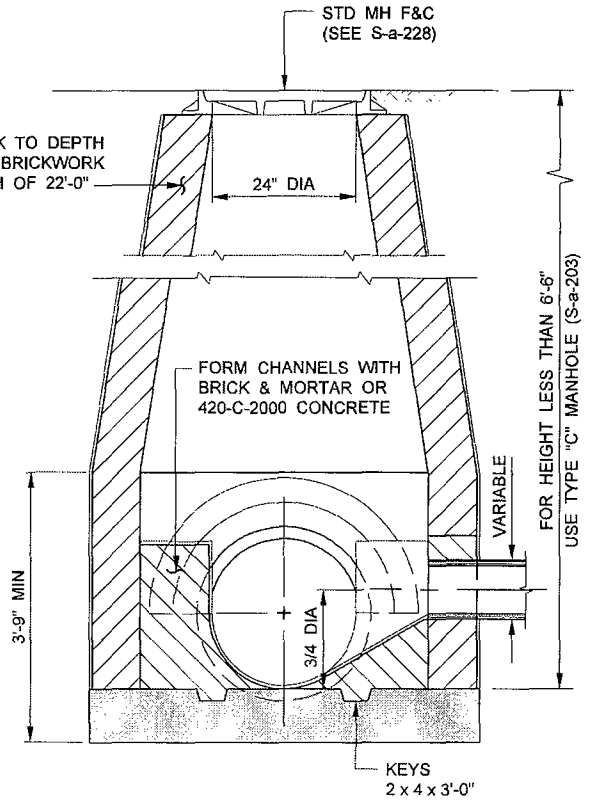
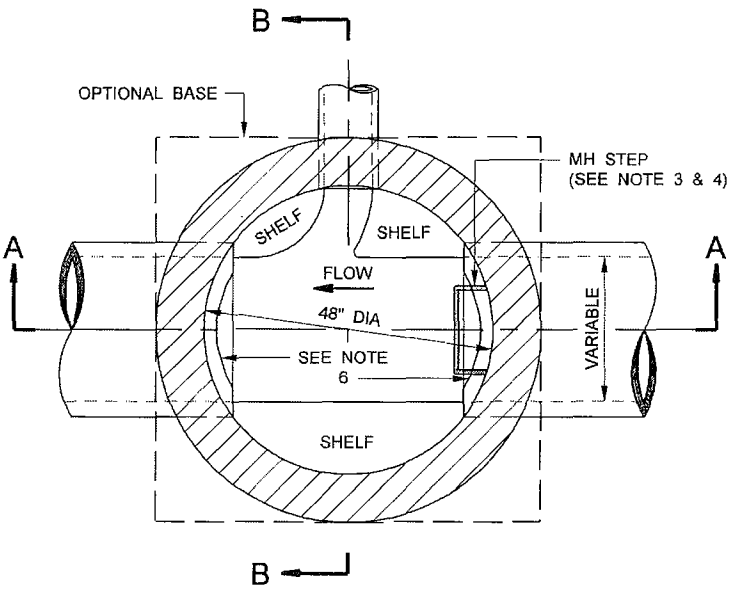


SECTION A-A



SECTION B-B



PLAN SECTION C-C

NOTES:

1. FOR 15" SEWERS AND LARGER, TURN 8" ARCH OVER PIPE.
2. FOR 12" SEWERS AND SMALLER, TURN 4" ARCH OVER PIPE.
3. THE LOWEST MANHOLE STEP SHALL BE PLACED NOT LESS THAN 8" NOR MORE THAN 24" ABOVE SHELF.
4. THE UPPER MANHOLE STEP SHALL BE PLACED BETWEEN THE TOP OF MANHOLE AND MANHOLE COVER FRAME AND SHALL PROJECT NOT MORE THAN 4" INSIDE MANHOLE. ALL OTHERS SHALL PROJECT 5".
5. FOR LAYING BRICK OR PLASTERING, THE MORTAR SHALL CONFORM WITH SECTION 201-5.1 (CLASS "D") OF THE STANDARD SPECIFICATIONS.
6. FOR 30" PIPE AND LARGER, THE TOP PORTION OF THE PIPES WITHIN THE MANHOLE SHALL BE CUT OUT TO PROVIDE A CIRCULAR OPENING BETWEEN THE PIPE ENDS OF NOT LESS THAN 42". THE CUT EDGES SHALL BE PLASTERED SMOOTH WITH CEMENT MORTAR FOR CONCRETE PIPE AND EPOXY FOR CLAY PIPE. THE CIRCULAR OPENING SHALL BE CUT PRIOR TO INSTALLATION OF THE RISER SECTIONS.

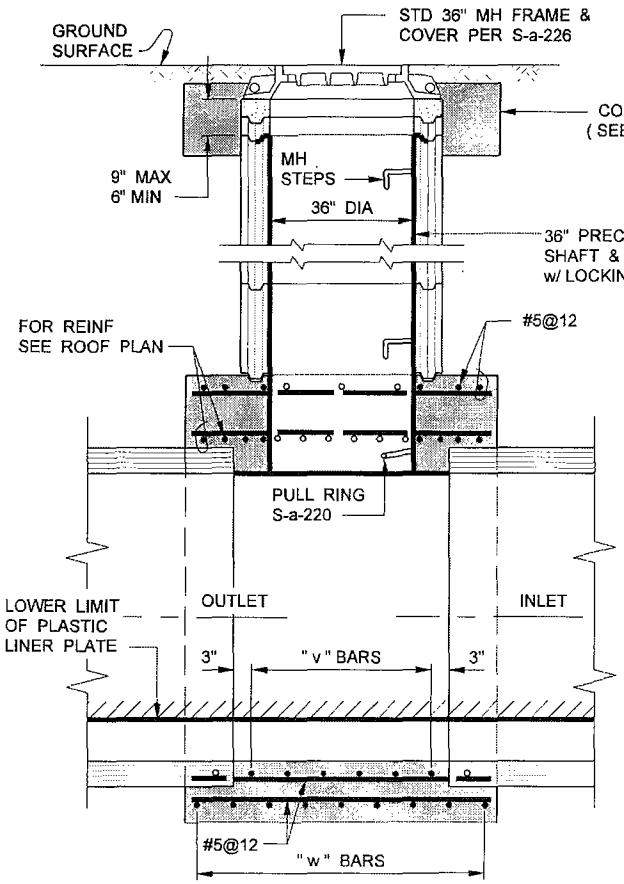
FOR 8" TO 30" PIPE

COUNTY SANITATION DISTRICTS OF LOS ANGELES COUNTY
OFFICE OF CHIEF ENGINEER

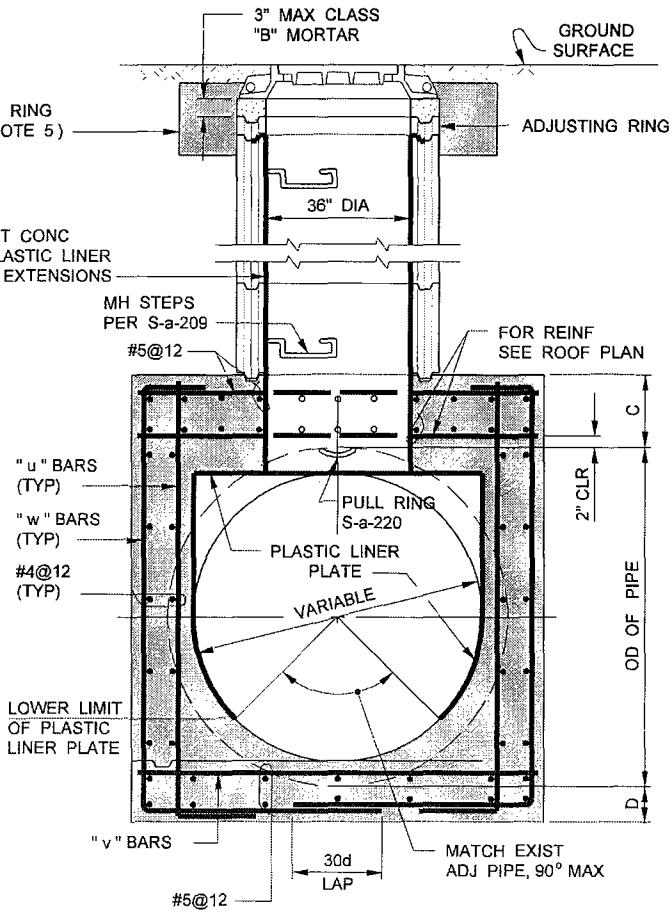
STEPHEN R. MAGUIN
CHIEF ENGINEER

STANDARD MANHOLE, TYPE "A"

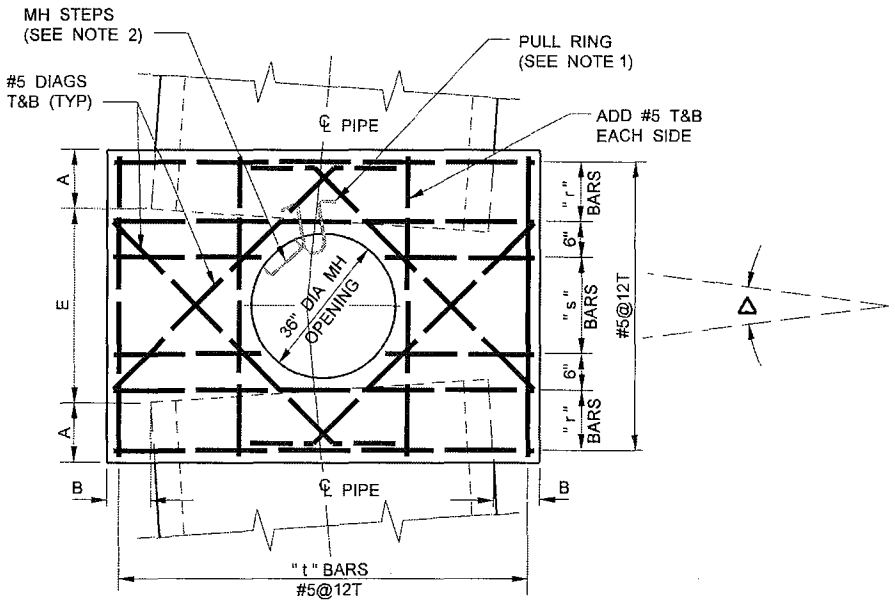
STANDARD DRAWING
2006 EDITION
S - a - 2 0 1
SHEET 1 OF 1



LONGITUDINAL SECTION



CROSS SECTION



ROOF PLAN 0° TO 15°

FOR 48" TO 96" PIPE

COUNTY SANITATION DISTRICTS OF LOS ANGELES COUNTY
OFFICE OF CHIEF ENGINEER

STEPHEN R. MAGUIN CHIEF ENGINEER	STANDARD MANHOLE, TYPE "B"	STANDARD DRAWING 2006 EDITION S - a - 202 SHEET 1 OF 3

COUNTY SANITATION DISTRICTS OF LOS ANGELES COUNTY

OFFICE OF CHIEF ENGINEER

STEPHEN R. MAGUIN
CHIEF ENGINEER

STANDARD MANHOLE, TYPE "B"

TABLE OF DIMENSIONS AND REINFORCING BARS

PIPE DIA	DEPTH TO INV	DIMENSIONS						REINFORCING BARS					
		A	B	C	D	E	Δ (MAX)	"r"	"s"	"t"	"u"	"v"	"w"
48"	UP TO 30'	8"	6"	12"	6"	4'-0"	15°	3 - #6	#6@6	#5@12	#4@6	#4@6	#4@6
	31' TO 50'			15"		4'-0"	15°	3 - #7	#7@6	#6@12	#4@6	#5@6	#5@6
51" TO 60"	UP TO 30'	8"	6"	15"	6"	4'-0"	10°	3 - #7	#7@6	#5@12	#4@6	#5@6	#5@6
						4'-4"	15°						
	31' TO 50'	8"	6"	18"	6"	4'-0"	10°	3 - #8	#8@6	#6@12	#5@6	#5@6	#6@6
						4'-4"	15°						
63" TO 72"	UP TO 30'	10"	7"	15"	7"	4'-0"	10°	4 - #7	#7@6	#5@12	#4@6	#6@6	#5@6
						4'-8"	15°						
	31' TO 50'	10"	7"	18"	7"	4'-0"	10°	4 - #8	#8@6	#6@12	#5@6	#7@6	#7@6
						4'-8"	15°						
75" TO 84"	UP TO 30'	10"	7"	16"	7"	4'-0"	8°	4 - #7	#7@6	#5@12	#5@6	#6@6	#6@6
						4'-10"	15°	5 - #7					
	31' TO 50'	10"	7"	18"	7"	4'-0"	8°	4 - #9	#9@6	#6@12	#6@6	#8@6	#7@6
						4'-10"	15°	5 - #9					
90" TO 96"	UP TO 30'	12"	8"	18"	8"	4'-0"	7°	4 - #8	#8@6	#5@12	#5@6	#7@6	#7@6
						5'-2"	15°	5 - #8					
	31' TO 50'	12"	8"	20"	8"	4'-0"	7°	4 - #9	#9@6	#6@12	#6@6	#8@6	#8@6
						5'-2"	15°	5 - #9					

STANDARD DRAWING
2006 EDITION
S - a - 2 0 2
SHEET 2 OF 3

NOTES:

1. ALL MANHOLES SHALL BE PROVIDED WITH A STANDARD PULL RING IN ACCORDANCE WITH S-a-220. THE PULL RING SHALL BE LOCATED 6" ABOVE THE SOFFIT ON THE UPSTREAM SIDE OF THE MANHOLE AND ALONG THE AXIS OF THE DOWNSTREAM OUTLET. WHERE THE MANHOLE IS TO BE USED AS A DOWNSTREAM SIPHON MANHOLE, IT SHALL BE PROVIDED WITH AN ADDITIONAL STANDARD PULL RING, BUT LOCATED 6" ABOVE THE SOFFIT ON THE DOWNSTREAM SIDE OF THE MANHOLE AND ON THE CENTERLINE OF THE UPSTREAM SIPHON PIPE.

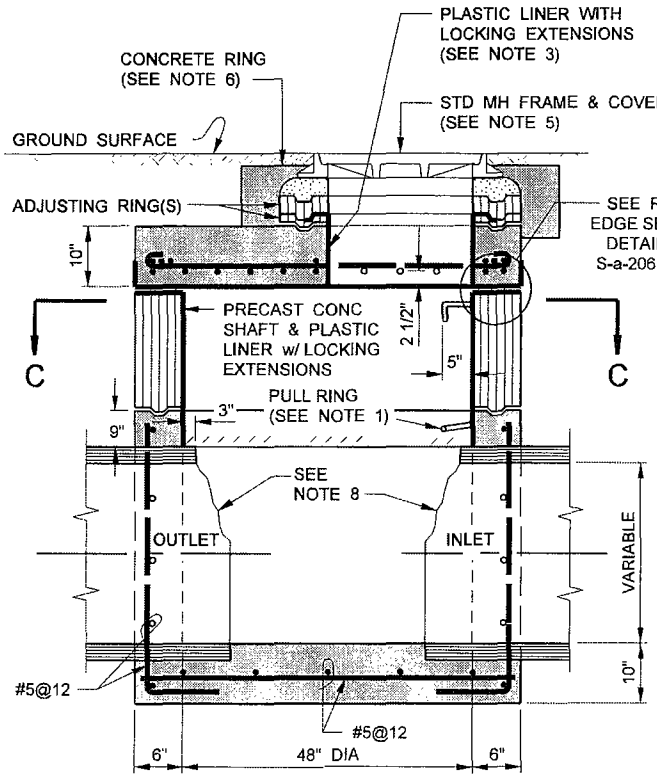
2. MANHOLE STEPS SHALL BE IN ACCORDANCE WITH S-a-209 AND SHALL BE UNIFORMLY SPACED NOT MORE THAN 16" APART. THE TOP STEP SHALL BE PLACED WITHIN 16" BELOW THE MANHOLE FRAME. THE BOTTOM MANHOLE STEP SHALL BE PLACED WITHIN 16" ABOVE THE TOP OF THE PIPE. THE MANHOLE STEP SHALL PROJECT 5". THE MANHOLE STEPS SHALL BE PLACED SUCH THAT THEY ARE ADJACENT TO BUT NOT INTERFERING WITH ACCESS TO THE PULL RING.

3. THE MANHOLE SHALL BE PROVIDED WITH PLASTIC LINER WITH LOCKING EXTENSIONS. THE PLASTIC LINER AND THE PLASTIC LINER INSTALLATION SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. THE LINER SHALL EXTEND FROM THE BOTTOM OF THE ADJUSTING RINGS TO A POINT IN THE CHANNEL MATCHING THE BOTTOM OF THE LINER IN THE LINED PIPE. LINER RETURNS SHALL BE PROVIDED WHERE THE LINER TERMINATES AT THE ADJUSTING RING. THE JOINT BETWEEN THE LINER AND THE STAINLESS STEEL STEPS AND PULL RINGS SHALL BE THOROUGHLY SEALED WITH MASTIC SEAM MATERIAL AS MANUFACTURED BY LINABOND INC., SYLMAR, CALIFORNIA (818) 362-7373, OR EQUAL. APPLICATION OF SEALANT AND PREPARATION OF SURFACES SHALL BE IN STRICT CONFORMANCE WITH THE MANUFACTURER'S DIRECTIONS.

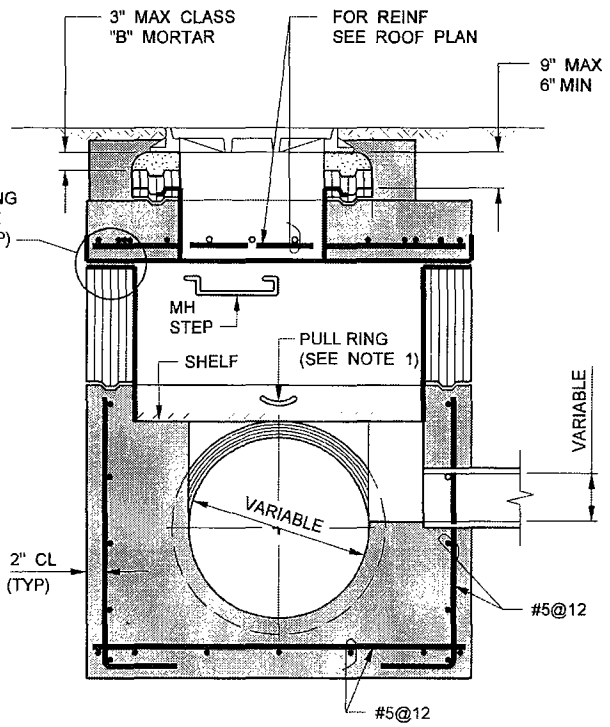
4. UNLESS OTHERWISE SPECIFIED, ALL CONCRETE SHALL BE 660-B-4000 AND ALL REINFORCING BARS SHALL BE DEFORMED BARS CONFORMING TO ASTM-A706 GRADE 60.

5. A 12" WIDE BY 12" HIGH CONCRETE RING SHALL BE PROVIDED AROUND THE MANHOLE FRAME. IN UNPAVED AREAS, THE CONCRETE RING SHALL BE PROVIDED WITH #3 REBAR, 30 DIAMETER LAP.

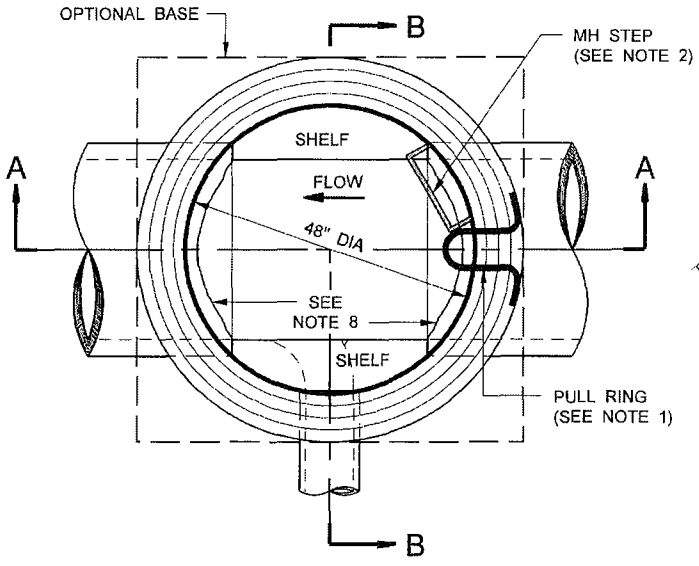
6. EXCEPT AS NOTED HEREON, THE PRECAST UNITS SHALL BE MANUFACTURED AND TESTED IN ACCORDANCE WITH ASTM C478. THE CURING OF THE PRECAST UNITS SHALL CONFORM TO SECTION 207-2.7 OF THE STANDARD SPECIFICATIONS. AS AN ALTERNATE, THE UNITS MAY BE CURED USING SATURATED STEAM FOR A MINIMUM OF 12 HOURS FOLLOWED BY 6 DAYS OF WATER CURING OR MEMBRANE CURING. IF THE UNITS ARE CURED BY THE ALTERNATE METHOD, THEY SHALL NOT BE SHIPPED PRIOR TO 8 DAYS AFTER CASTING NOR UNTIL THE CONCRETE HAS ATTAINED A MINIMUM STRENGTH OF 4,000 PSI. THE RISER SECTIONS MAY BE REINFORCED OR UNREINFORCED. REINFORCED SECTIONS SHALL HAVE A MINIMUM WALL THICKNESS OF 5" AND UNREINFORCED SECTIONS SHALL HAVE A MINIMUM WALL THICKNESS OF 6". JOINTS SHALL BE TONGUE AND GROOVE AND SHALL BE ASSEMBLED USING CLASS "B" MORTAR. THE MORTARED JOINTS SHALL BE FLUSH AND TROWELED SMOOTH.



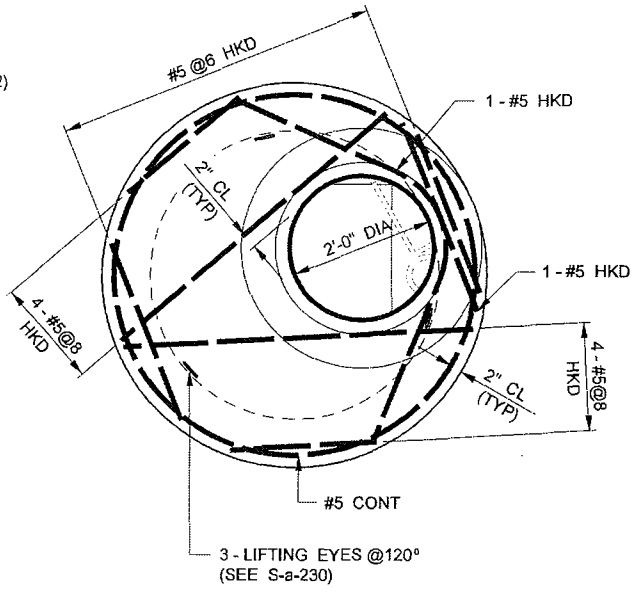
SECTION A-A



SECTION B-B



PLAN SECTION C-C



ROOF PLAN

FOR 8" TO 30" PIPE

COUNTY SANITATION DISTRICTS OF LOS ANGELES COUNTY
OFFICE OF CHIEF ENGINEER

STEPHEN R. MAGUIN
CHIEF ENGINEER

STANDARD MANHOLE, TYPE "C"

STANDARD DRAWING
2006 EDITION
S - a - 2 0 3
SHEET 1 OF 3

NOTES:

1. ALL MANHOLES SHALL BE PROVIDED WITH A STANDARD PULL RING IN ACCORDANCE WITH S-a-220. THE PULL RING SHALL BE LOCATED 5" ABOVE THE TOP OF THE PIPE ON THE UPSTREAM SIDE OF THE MANHOLE AND ALONG THE AXIS OF THE DOWNSTREAM OUTLET. WHERE THE MANHOLE IS TO BE USED AS A DOWNSTREAM SIPHON MANHOLE, IT SHALL BE PROVIDED WITH AN ADDITIONAL STANDARD PULL RING, BUT LOCATED 5" ABOVE THE TOP OF THE PIPE ON THE DOWNSTREAM SIDE OF THE MANHOLE AND ON THE CENTERLINE OF THE UPSTREAM SIPHON PIPE.

2. MANHOLE STEPS SHALL BE IN ACCORDANCE WITH S-a-209 AND SHALL BE UNIFORMLY SPACED NOT MORE THAN 16" APART. THE TOP STEP SHALL BE PLACED WITHIN 16" BELOW THE MANHOLE FRAME. THE BOTTOM MANHOLE STEP SHALL BE PLACED WITHIN 16" ABOVE THE SHELF. THE MANHOLE STEP SHALL PROJECT 5". THE MANHOLE STEPS SHALL BE PLACED SUCH THAT THEY ARE ADJACENT TO BUT NOT INTERFERING WITH ACCESS TO THE PULL RING.

3. THE MANHOLE SHALL BE PROVIDED WITH PLASTIC LINER WITH LOCKING EXTENSIONS. PLASTIC LINER WITH LOCKING EXTENSIONS SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. THE LINER SHALL EXTEND FROM THE BOTTOM OF THE ADJUSTING RINGS TO THE TOP OF THE SHELF. LINER RETURNS SHALL BE PROVIDED WHERE THE LINER TERMINATES AT THE ADJUSTING RING AND THE SHELF. THE JOINT BETWEEN THE LINER AND THE STAINLESS STEEL STEPS AND PULL RING SHALL BE THOROUGHLY SEALED WITH MASTIC SEAM MATERIAL AS MANUFACTURED BY LINABOND INC., SYLMAR, CALIFORNIA (818) 362-7373, OR EQUAL. APPLICATION OF SEALANT AND PREPARATION OF SURFACES SHALL BE IN STRICT CONFORMANCE WITH THE MANUFACTURER'S DIRECTIONS.

4. UNLESS OTHERWISE SPECIFIED, ALL CONCRETE SHALL BE 660-B-4000 ALL REINFORCING BARS SHALL BE DEFORMED BARS CONFORMING TO ASTM-A706 GRADE 60.

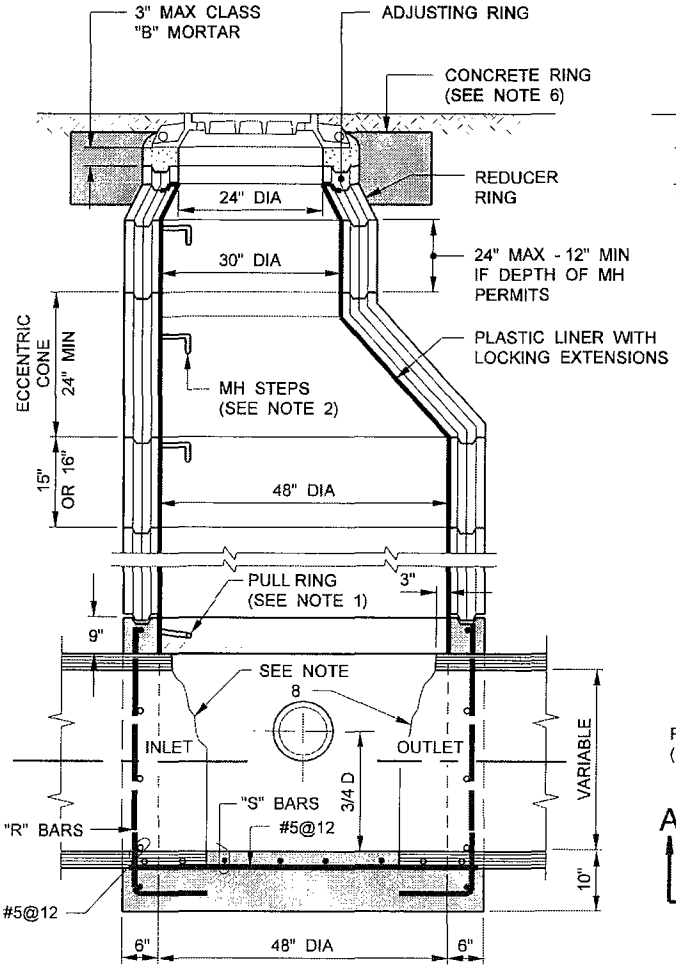
5. IN PAVED AREAS SUBJECT TO TRAFFIC, A 24" TRAFFIC MANHOLE FRAME AND COVER IN ACCORDANCE WITH S-a-228 SHALL BE PROVIDED. IN ALL OTHER AREAS, A 24" LOCKING MANHOLE FRAME AND COVER IN ACCORDANCE WITH S-a-207 SHALL BE PROVIDED.

6. A 12" WIDE BY 12" HIGH CONCRETE RING SHALL BE PROVIDED AROUND THE MANHOLE FRAME. IN UNPAVED AREAS, THE CONCRETE RING SHALL BE PROVIDED WITH #3 REBAR, 30 DIAMETER LAP.

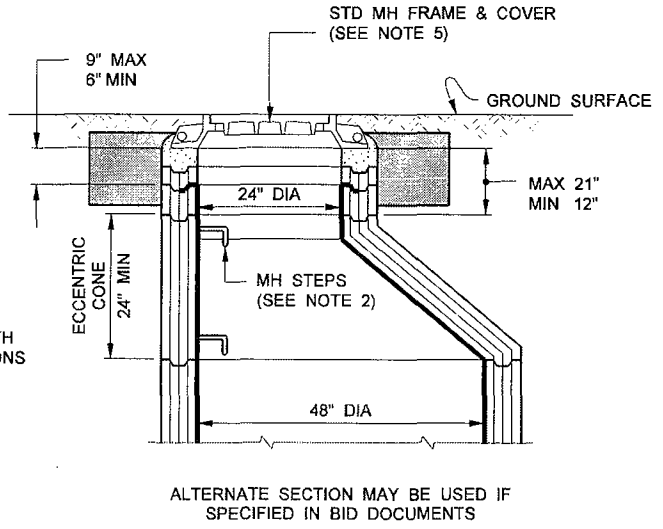
NOTES:

7. EXCEPT AS NOTED HEREON, THE PRECAST UNITS SHALL BE MANUFACTURED AND TESTED IN ACCORDANCE WITH ASTM C478. THE CURING OF THE PRECAST UNITS SHALL CONFORM TO SECTION 207-2.7 OF THE STANDARD SPECIFICATIONS. AS AN ALTERNATE, THE UNITS MAY BE CURED USING SATURATED STEAM FOR A MINIMUM OF 12 HOURS FOLLOWED BY 6 DAYS OF WATER CURING OR MEMBRANE CURING. IF THE UNITS ARE CURED BY THE ALTERNATE METHOD, THEY SHALL NOT BE SHIPPED PRIOR TO 8 DAYS AFTER CASTING NOR UNTIL THE CONCRETE HAS ATTAINED A MINIMUM STRENGTH OF 4,000 PSI. THE RISER SECTIONS MAY BE REINFORCED OR UNREINFORCED. REINFORCED SECTIONS, INCLUDING ECCENTRIC CONES, SHALL HAVE A MINIMUM WALL THICKNESS OF 5" AND UNREINFORCED SECTIONS, INCLUDING CONES, SHALL HAVE A MINIMUM WALL THICKNESS OF 6". JOINTS SHALL BE TONGUE AND GROOVE AND SHALL BE ASSEMBLED USING CLASS "B" MORTAR. THE MORTARED JOINTS SHALL BE FLUSH AND TROWELED SMOOTH.

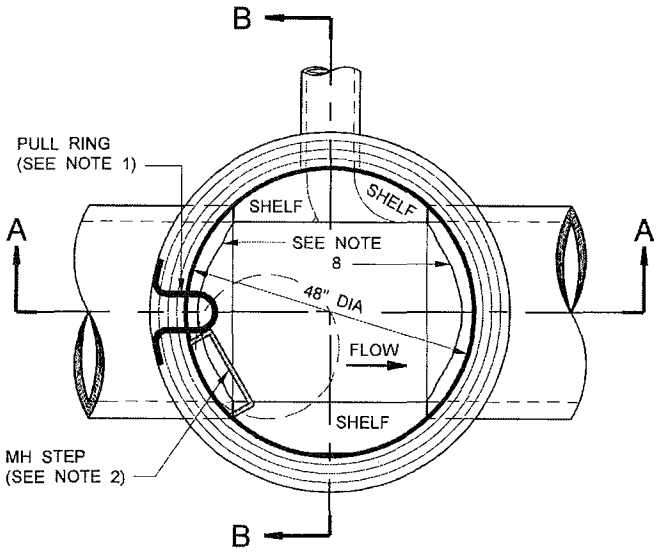
8. THE TOP PORTION OF THE PIPES WITHIN THE MANHOLE SHALL BE CUT OUT AS NECESSARY TO PROVIDE A CIRCULAR OPENING BETWEEN THE PIPE ENDS OF AT LEAST 42". THE CUT ENDS SHALL BE PLASTERED SMOOTH WITH CEMENT MORTAR FOR CONCRETE PIPE AND EPOXY FOR CLAY PIPE. THE CIRCULAR OPENING SHALL BE CUT PRIOR TO INSTALLATION OF THE RISER SECTIONS.



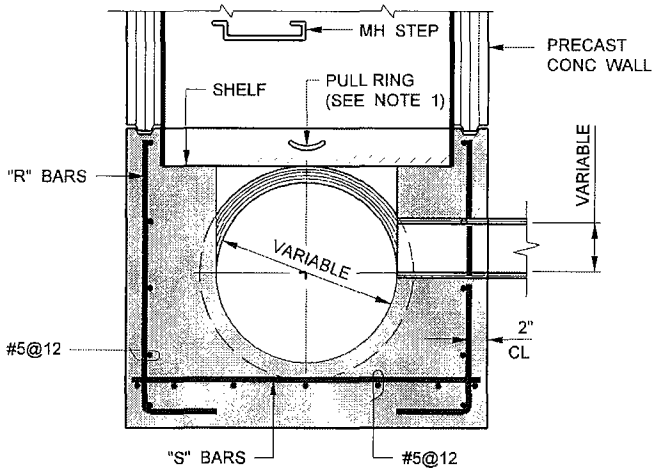
SECTION A-A



ALTERNATE SECTION MAY BE USED IF SPECIFIED IN BID DOCUMENTS



PLAN



SECTION B-B

TABLE OF REINFORCING BARS			
PIPE DIA	DEPTH TO INV	BARS "R"	BARS "S"
8" TO 21"	UP TO 15'	#5@12	#5@12
	16' TO 30'	#6@12	#6@12
24" TO 30"	UP TO 15'	#5@12	#5@12
	16' TO 30'	#7@12	#6@12

FOR 8" TO 30" PIPE

COUNTY SANITATION DISTRICTS OF LOS ANGELES COUNTY
OFFICE OF CHIEF ENGINEER

STEPHEN R. MAGUIN
CHIEF ENGINEER

STANDARD MANHOLE, TYPE "D"

STANDARD DRAWING
2006 EDITION
S - a - 2 0 4
SHEET 1 OF 3

NOTES:

1. ALL MANHOLES SHALL BE PROVIDED WITH A STANDARD PULL RING IN ACCORDANCE WITH S-a-220. THE PULL RING SHALL BE LOCATED 5" ABOVE THE TOP OF PIPE ON THE UPSTREAM SIDE OF THE MANHOLE AND ALONG THE AXIS OF THE DOWNSTREAM OUTLET. WHERE THE MANHOLE IS TO BE USED AS A DOWNSTREAM SIPHON MANHOLE, IT SHALL BE PROVIDED WITH AN ADDITIONAL STANDARD PULL RING, BUT LOCATED 5" ABOVE THE TOP OF PIPE ON THE DOWNSTREAM SIDE OF THE MANHOLE AND ON THE CENTERLINE OF THE UPSTREAM SIPHON PIPE.

2. MANHOLE STEPS SHALL BE IN ACCORDANCE WITH S-a-209 AND SHALL BE UNIFORMLY SPACED NOT MORE THAN 16" APART. THE TOP STEP SHALL BE PLACED WITHIN 16" BELOW THE MANHOLE FRAME. THE BOTTOM MANHOLE STEP SHALL BE PLACED WITHIN 16" ABOVE THE SHELF. IN MANHOLE SHAFTS 36" IN DIAMETER AND LARGER, THE MANHOLE STEP SHALL PROJECT 5". IN MANHOLE SHAFTS SMALLER THAN 36" IN DIAMETER, THE MANHOLE STEP SHALL PROJECT 4". THE MANHOLE STEPS SHALL BE PLACED SUCH THAT THEY ARE ADJACENT TO BUT NOT INTERFERING WITH ACCESS TO THE PULL RING.

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6. A 12" WIDE BY 12" HIGH CONCRETE RING SHALL BE PROVIDED AROUND THE MANHOLE FRAME. IN UNPAVED AREAS, THE CONCRETE RING SHALL BE PROVIDED WITH #3 REBAR, 30 DIAMETER LAP.

NOTES:

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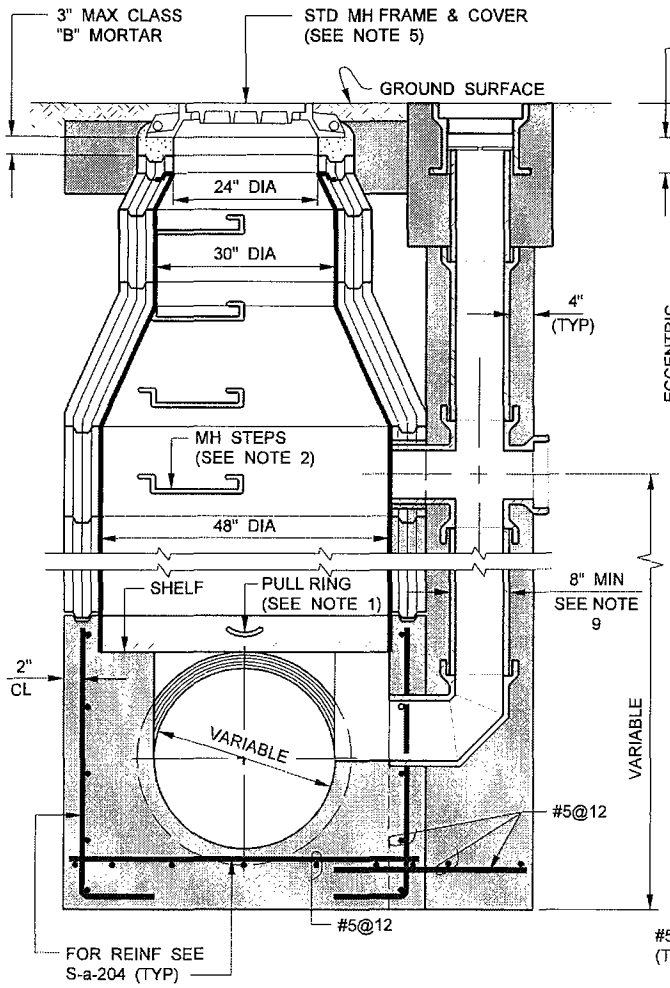
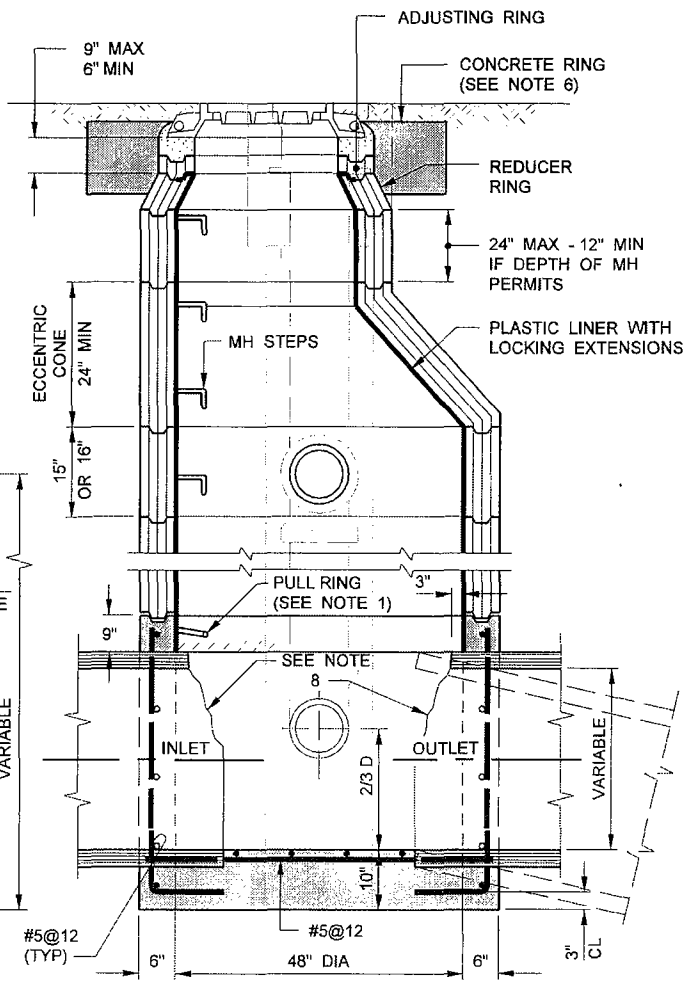
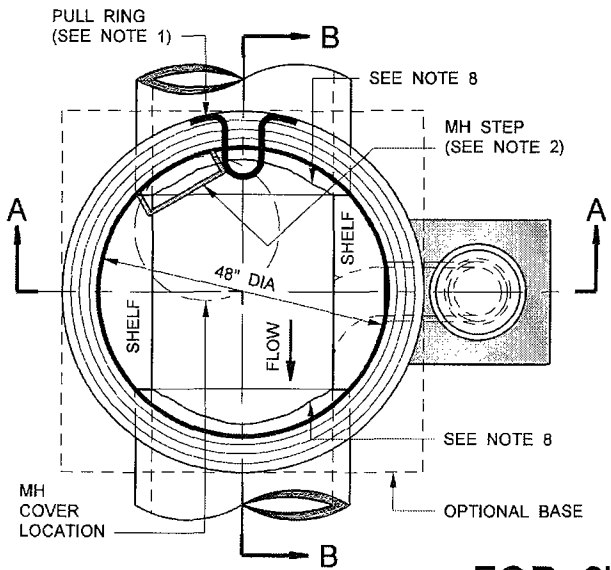


SECTION A-A



SECTION B-B



PLAN

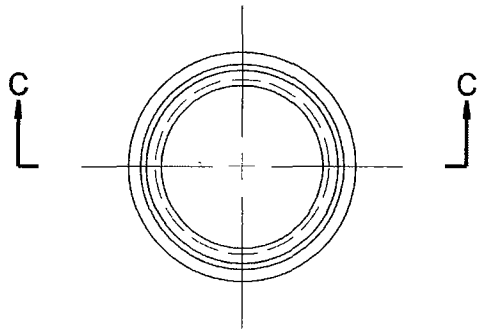
FOR 8" TO 30" PIPE

COUNTY SANITATION DISTRICTS OF LOS ANGELES COUNTY
OFFICE OF CHIEF ENGINEER

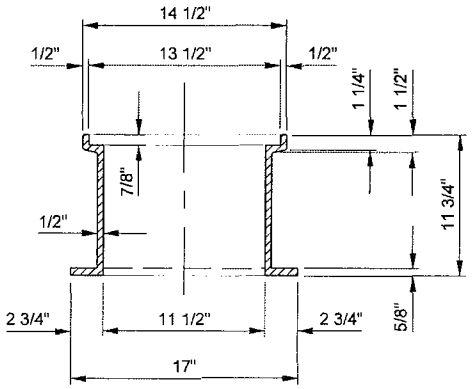
STEPHEN R. MAGUIN
CHIEF ENGINEER

STANDARD DROP MANHOLE

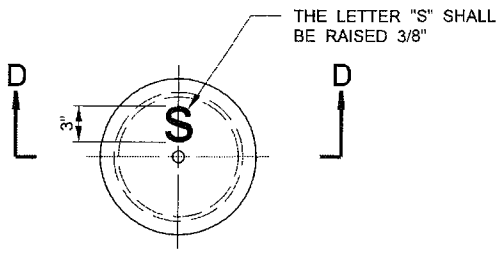
STANDARD DRAWING
2006 EDITION
S - a - 2 0 5
SHEET 1 OF 4



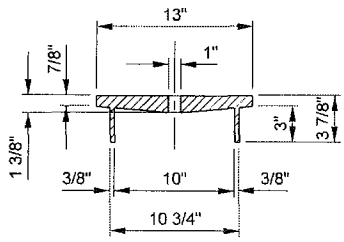
ACCESS FRAME



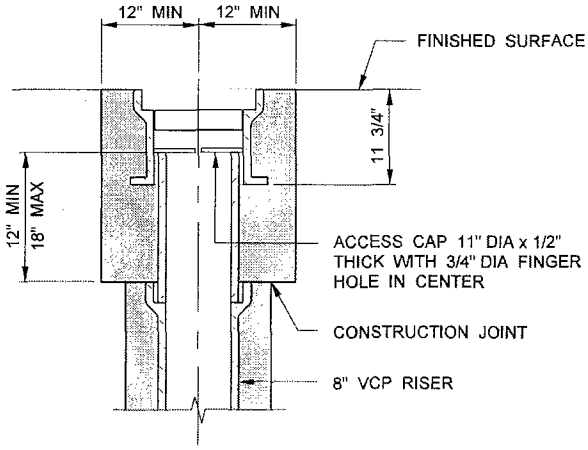
SECTION C-C



ACCESS COVER



SECTION D-D



DETAIL

COUNTY SANITATION DISTRICTS OF LOS ANGELES COUNTY
OFFICE OF CHIEF ENGINEER

STEPHEN R. MAGUIN
CHIEF ENGINEER

STANDARD DROP MANHOLE

STANDARD DRAWING
2006 EDITION
S - a - 2 0 5
SHEET 2 OF 4

NOTES:

1. ALL MANHOLES SHALL BE PROVIDED WITH A STANDARD PULL RING IN ACCORDANCE WITH S-a-220. THE PULL RING SHALL BE LOCATED 5" ABOVE THE TOP OF PIPE ON THE UPSTREAM SIDE OF THE MANHOLE AND ALONG THE AXIS OF THE DOWNSTREAM OUTLET. WHERE THE MANHOLE IS TO BE USED AS A DOWNSTREAM SIPHON MANHOLE, IT SHALL BE PROVIDED WITH AN ADDITIONAL STANDARD PULL RING, BUT LOCATED 5" ABOVE THE TOP OF PIPE ON THE DOWNSTREAM SIDE OF THE MANHOLE AND ON THE CENTERLINE OF THE UPSTREAM SIPHON PIPE.

2. MANHOLE STEPS SHALL BE IN ACCORDANCE WITH S-a-209 AND SHALL BE UNIFORMLY SPACED NOT MORE THAN 16" APART. THE TOP STEP SHALL BE PLACED WITHIN 16" BELOW THE MANHOLE FRAME. THE BOTTOM MANHOLE STEP SHALL BE PLACED WITHIN 16" ABOVE THE SHELF. IN MANHOLE SHAFTS 36" IN DIAMETER AND LARGER, THE MANHOLE STEP SHALL PROJECT 5". IN MANHOLE SHAFTS SMALLER THAN 36" IN DIAMETER, THE MANHOLE STEP SHALL PROJECT 4". THE MANHOLE STEPS SHALL BE PLACED SUCH THAT THEY ARE ADJACENT TO BUT NOT INTERFERING WITH ACCESS TO THE PULL RING.

3. THE MANHOLE SHALL BE PROVIDED WITH PLASTIC LINER WITH LOCKING EXTENSIONS. PLASTIC LINER WITH LOCKING EXTENSIONS SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. THE LINER SHALL EXTEND FROM THE BOTTOM OF THE ADJUSTING RINGS TO THE TOP OF THE SHELF. LINER RETURNS SHALL BE PROVIDED WHERE THE LINER TERMINATES AT THE ADJUSTING RING AND THE SHELF. THE JOINT BETWEEN THE LINER AND THE STAINLESS STEEL STEPS AND PULL RINGS SHALL BE THOROUGHLY SEALED WITH MASTIC SEAM MATERIAL AS MANUFACTURED BY LINABOND INC., SYLMAR, CALIFORNIA (818) 362-7373, OR EQUAL. APPLICATION OF SEALANT AND PREPARATION OF SURFACES SHALL BE IN STRICT CONFORMANCE WITH THE MANUFACTURER'S DIRECTIONS.

4. UNLESS OTHERWISE SPECIFIED, ALL CONCRETE SHALL BE 660-B-4000 AND ALL REINFORCING BARS SHALL BE DEFORMED BARS CONFORMING TO ASTM-A706 GRADE 60.

5. IN PAVED AREAS SUBJECT TO TRAFFIC, A 24" TRAFFIC MANHOLE FRAME AND COVER IN ACCORDANCE WITH S-a-228 SHALL BE PROVIDED. IN ALL OTHER AREAS, A 24" LOCKING MANHOLE FRAME AND COVER IN ACCORDANCE WITH S-a-207 SHALL BE PROVIDED. IF A 30" MANHOLE FRAME AND COVER IS REQUIRED, A FRAME AND COVER IN ACCORDANCE WITH S-a-223 SHALL BE PROVIDED AND INSTALLED WHERE THE REDUCER RING IS SHOWN AND THE REDUCER RING, 24" ADJUSTING RINGS, AND 24" FRAME AND COVER SHALL BE OMITTED.

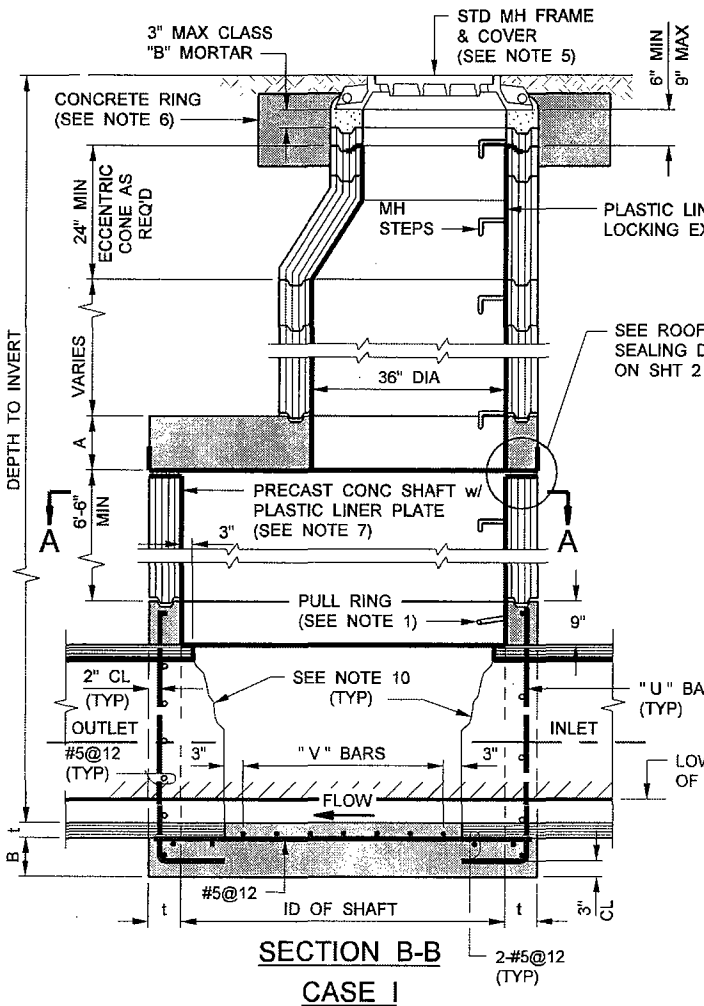
6. A 12" WIDE BY 12" HIGH CONCRETE RING SHALL BE PROVIDED AROUND THE MANHOLE FRAME. IN UNPAVED AREAS, THE CONCRETE RING SHALL BE PROVIDED WITH #3 REBAR, 30 DIAMETER LAP.

NOTES:

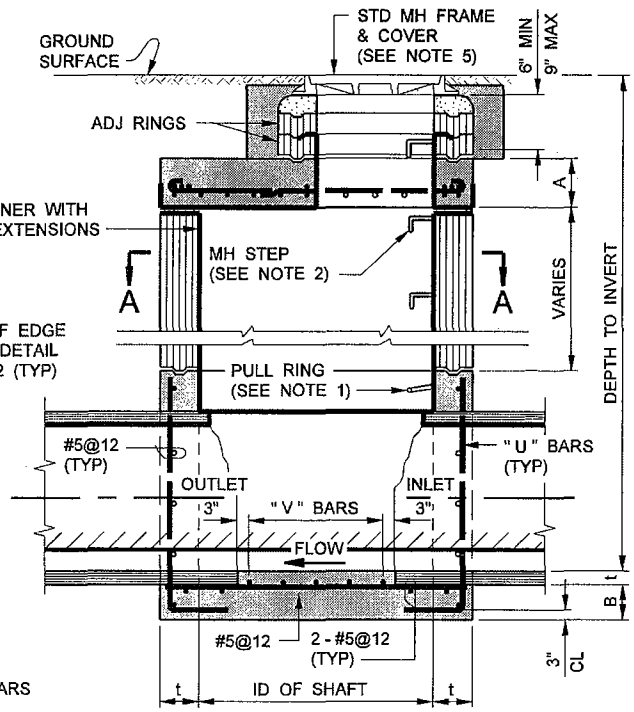
7. EXCEPT AS NOTED HEREON, THE PRECAST UNITS SHALL BE MANUFACTURED AND TESTED IN ACCORDANCE WITH ASTM C478. THE CURING OF THE PRECAST UNITS SHALL CONFORM TO SECTION 207-2.7 OF THE STANDARD SPECIFICATIONS. AS AN ALTERNATE, THE UNITS MAY BE CURED USING SATURATED STEAM FOR A MINIMUM OF 12 HOURS FOLLOWED BY 6 DAYS OF WATER CURING OR MEMBRANE CURING. IF THE UNITS ARE CURED BY THE ALTERNATE METHOD, THEY SHALL NOT BE SHIPPED PRIOR TO 8 DAYS AFTER CASTING NOR UNTIL THE CONCRETE HAS ATTAINED A MINIMUM STRENGTH OF 4,000 PSI. THE RISER SECTIONS MAY BE REINFORCED OR UNREINFORCED. REINFORCED SECTIONS, INCLUDING ECCENTRIC CONES, SHALL HAVE A MINIMUM WALL THICKNESS OF 5" AND UNREINFORCED SECTIONS, INCLUDING CONES, SHALL HAVE A MINIMUM WALL THICKNESS OF 6". JOINTS SHALL BE TONGUE AND GROOVE AND SHALL BE ASSEMBLED USING CLASS "B" MORTAR. THE MORTARED JOINTS SHALL BE FLUSH AND TROWELED SMOOTH.

8. THE TOP PORTION OF THE PIPES WITHIN THE MANHOLE SHALL BE CUT OUT AS NECESSARY TO PROVIDE A CIRCULAR OPENING BETWEEN THE PIPE ENDS OF AT LEAST 42". THE CUT ENDS SHALL BE PLASTERED SMOOTH WITH CEMENT MORTAR FOR CONCRETE PIPE AND EPOXY FOR CLAY PIPE. THE CIRCULAR OPENING SHALL BE CUT PRIOR TO INSTALLATION OF THE RISER SECTIONS.

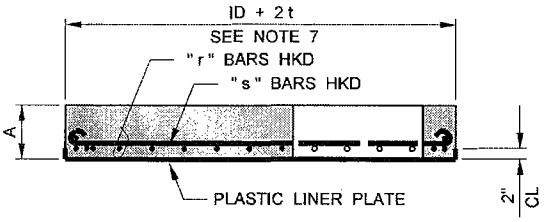
9. THE DROP CONNECTION INTO THE MANHOLE SHALL BE VCP AND SHALL BE THE SAME SIZE AS THE LATERAL SEWER OR A MINIMUM OF 8" IN DIAMETER, WHICHEVER IS LARGER. THE RISER SHALL BE 8" VCP.

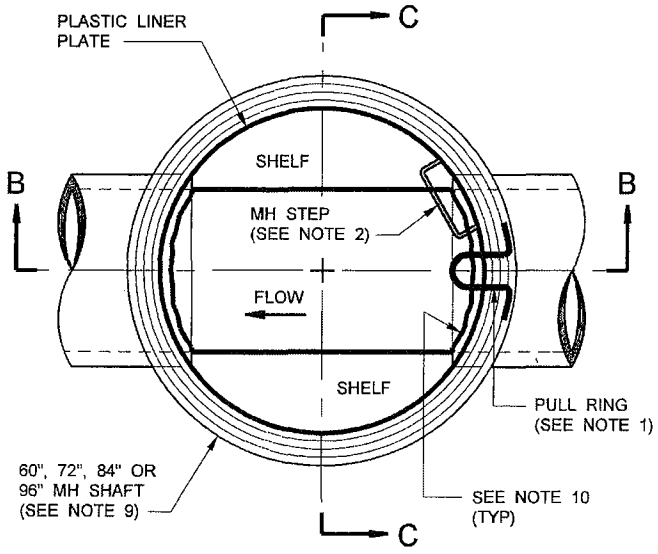


SECTION B-B
CASE I

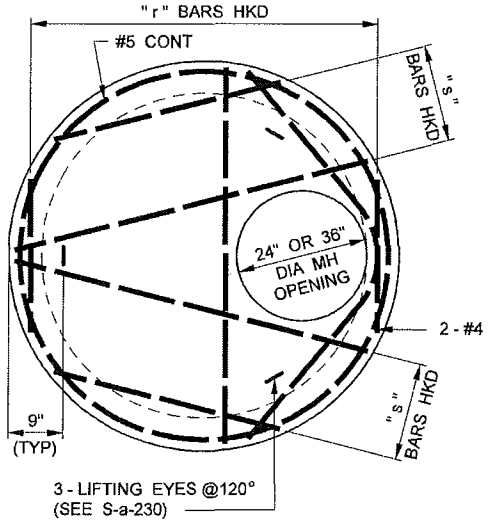


SECTION B-B
CASE II





PLAN - SECTION A-A



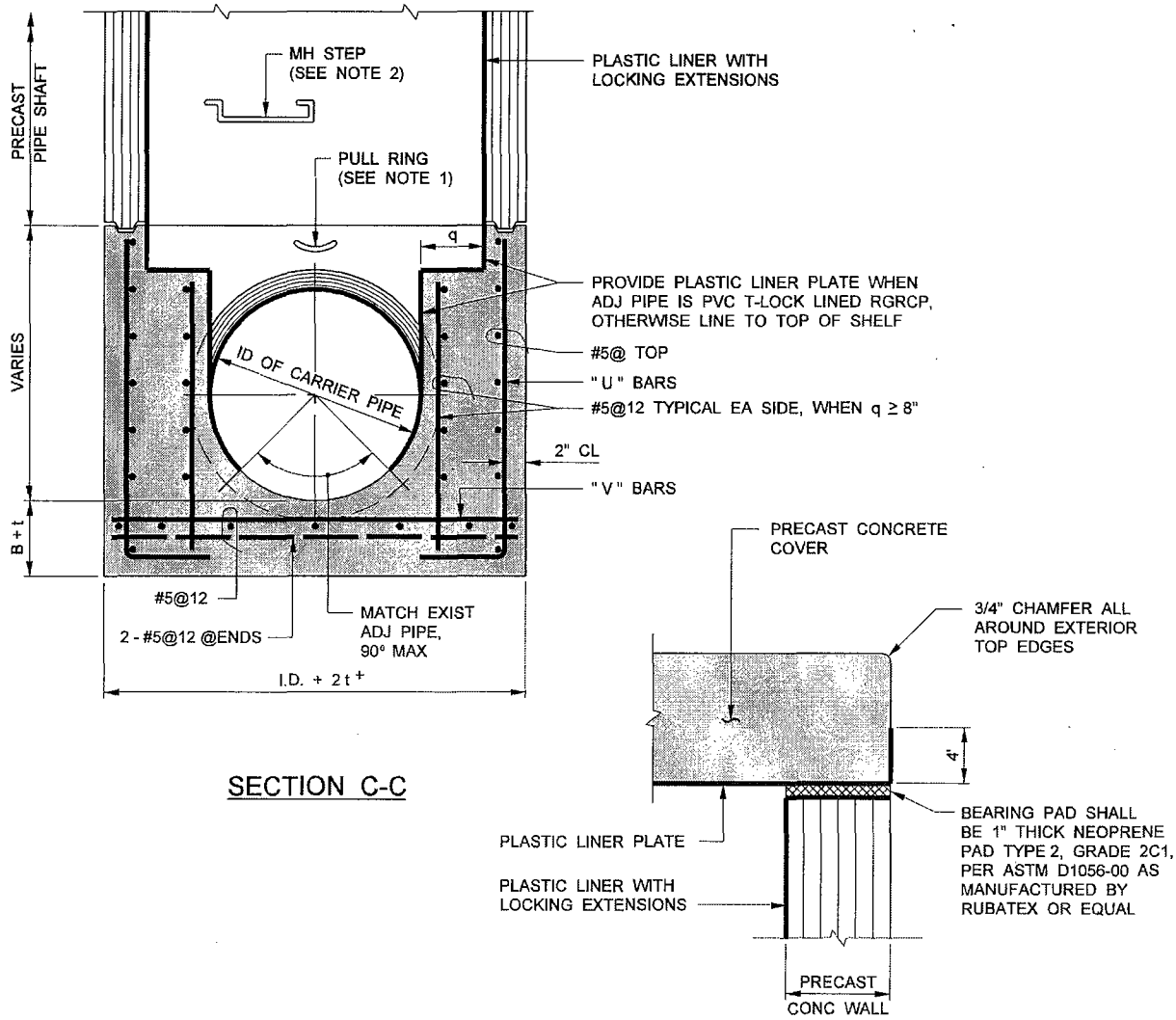
DETAIL OF FLAT SLAB TOP
24" OR 36" x 60", 72", 84" OR 96"

COUNTY SANITATION DISTRICTS OF LOS ANGELES COUNTY
OFFICE OF CHIEF ENGINEER

STEPHEN R. MAGUIN
CHIEF ENGINEER

STANDARD MANHOLE, TYPE "E"

STANDARD DRAWING
2006 EDITION
S-a-206
SHEET 1 OF 4



SECTION C-C

ROOF EDGE SEALING DETAIL

TABLE OF REINFORCING BARS							
SHAFT DIA	DEPTH TO INV	DIMENSIONS		REINFORCING BARS			
		A	B	"r"	"s"	"u"	"v"
60"	UP TO 15'	10"	8"	#6@6	#6@6	#5@12	#5@12
	16' TO 30'	12"	10"	#7@6	#7@6	#6@10	#6@12
72"	UP TO 15'	10"	8"	#6@6	#6@6	#5@12	#5@12
	16' TO 30'	12"	10"	#8@6	#8@6	#7@12	#7@12
84"	UP TO 15'	10"	10"	#7@6	#7@6	#5@12	#5@12
	16' TO 30'	14"	10"	#8@6	#8@6	#7@12	#8@12
96"	UP TO 15'	12"	10"	#7@6	#7@6	#6@12	#6@12
	16' TO 30'	15"	12"	#8@6	#8@6	#7@6	#8@12

COUNTY SANITATION DISTRICTS OF LOS ANGELES COUNTY
OFFICE OF CHIEF ENGINEER

STEPHEN R. MAGUIN
CHIEF ENGINEER

STANDARD MANHOLE, TYPE "E"

STANDARD DRAWING
2006 EDITION
S - a - 2 0 6

NOTES:

1. ALL MANHOLES SHALL BE PROVIDED WITH A STANDARD PULL RING IN ACCORDANCE WITH S-a-220. THE PULL RING SHALL BE LOCATED 5" ABOVE THE TOP OF PIPE ON THE UPSTREAM SIDE OF THE MANHOLE AND ALONG THE AXIS OF THE DOWNSTREAM OUTLET. WHERE THE MANHOLE IS TO BE USED AS A DOWNSTREAM SIPHON MANHOLE, IT SHALL BE PROVIDED WITH AN ADDITIONAL STANDARD PULL RING, BUT LOCATED 5" ABOVE THE TOP OF PIPE ON THE DOWNSTREAM SIDE OF THE MANHOLE AND ON THE CENTERLINE OF THE UPSTREAM SIPHON PIPE.

2. MANHOLE STEPS SHALL BE IN ACCORDANCE WITH S-a-209 AND SHALL BE UNIFORMLY SPACED NOT MORE THAN 16" APART. THE TOP STEP SHALL BE PLACED WITHIN 16" BELOW THE MANHOLE FRAME. THE BOTTOM MANHOLE STEP SHALL BE PLACED WITHIN 16" ABOVE THE SHELF. IN MANHOLE SHAFTS 36" IN DIAMETER AND LARGER, THE MANHOLE STEP SHALL PROJECT 5". IN MANHOLE SHAFTS SMALLER THAN 36" IN DIAMETER, THE MANHOLE STEP SHALL PROJECT 4". THE MANHOLE STEPS SHALL BE PLACED SUCH THAT THEY ARE ADJACENT TO BUT NOT INTERFERING WITH ACCESS TO THE PULL RING.

3. THE MANHOLE SHALL BE PROVIDED WITH PLASTIC LINER WITH LOCKING EXTENSIONS. PLASTIC LINER WITH LOCKING EXTENSIONS SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. THE LINER SHALL EXTEND FROM THE BOTTOM OF THE ADJUSTING RINGS TO THE TOP OF THE SHELF UNLESS THE ADJACENT PIPE IS LINED. IF THE ADJACENT PIPE IS LINED, THE LINER SHALL EXTEND TO A POINT IN THE CHANNEL MATCHING THE BOTTOM OF THE LINER IN THE LINED PIPE. LINER RETURNS SHALL BE PROVIDED WHERE THE LINER TERMINATES AT THE ADJUSTING RING AND THE SHELF. THE JOINT BETWEEN THE LINER AND THE STAINLESS STEEL STEPS AND PULL RINGS SHALL BE THOROUGHLY SEALED WITH MASTIC SEAM MATERIAL AS MANUFACTURED BY LINABOND INC., SYLMAR, CALIFORNIA (818) 362-7373, OR EQUAL. APPLICATION OF SEALANT AND PREPARATION OF SURFACES SHALL BE IN STRICT CONFORMANCE WITH THE MANUFACTURER'S DIRECTIONS.

4. UNLESS OTHERWISE SPECIFIED, ALL CONCRETE SHALL BE 660-B-4000 AND ALL REINFORCING BARS SHALL BE DEFORMED BARS CONFORMING TO ASTM-A706 GRADE 60.

5. IN PAVED AREAS SUBJECT TO TRAFFIC, A 24" TRAFFIC MANHOLE FRAME AND COVER IN ACCORDANCE WITH S-a-228 SHALL BE PROVIDED. IN ALL OTHER AREAS, A 24" LOCKING MANHOLE FRAME AND COVER IN ACCORDANCE WITH S-a-207 SHALL BE PROVIDED. IF A 36" MANHOLE FRAME WITH 30" COVER IS REQUIRED, A FRAME AND COVER IN ACCORDANCE WITH S-a-226 SHALL BE PROVIDED.

6. A 12" WIDE BY 12" HIGH CONCRETE RING SHALL BE PROVIDED AROUND THE MANHOLE FRAME. IN UNPAVED AREAS, THE CONCRETE RING SHALL BE PROVIDED WITH #3 REBAR, 30 DIAMETER LAP.

NOTES:

7. EXCEPT AS NOTED HEREON, THE PRECAST UNITS SHALL BE MANUFACTURED AND TESTED IN ACCORDANCE WITH ASTM C478. THE CURING OF THE PRECAST UNITS SHALL CONFORM TO SECTION 207-2.7 OF THE STANDARD SPECIFICATIONS. AS AN ALTERNATE, THE UNITS MAY BE CURED USING SATURATED STEAM FOR A MINIMUM OF 12 HOURS FOLLOWED BY 6 DAYS OF WATER CURING OR MEMBRANE CURING. IF THE UNITS ARE CURED BY THE ALTERNATE METHOD, THEY SHALL NOT BE SHIPPED PRIOR TO 8 DAYS AFTER CASTING NOR UNTIL THE CONCRETE HAS ATTAINED A MINIMUM STRENGTH OF 4,000 PSI. THE RISER SECTIONS MAY BE REINFORCED OR UNREINFORCED. REINFORCED SECTIONS, INCLUDING ECCENTRIC CONES, SHALL HAVE A MINIMUM WALL THICKNESS OF 5" AND UNREINFORCED SECTIONS, INCLUDING CONES, SHALL HAVE A MINIMUM WALL THICKNESS OF 6". JOINTS SHALL BE TONGUE AND GROOVE AND SHALL BE ASSEMBLED USING CLASS "B" MORTAR. THE MORTARED JOINTS SHALL BE FLUSH AND TROWELED SMOOTH.

8. UNLESS OTHERWISE INDICATED ON THE DRAWINGS, CASE I OR II MAY BE USED BY THE CONTRACTOR AT HIS OPTION CONSISTENT WITH DIAMETER COVER LIMITATIONS INDICATED HEREON.

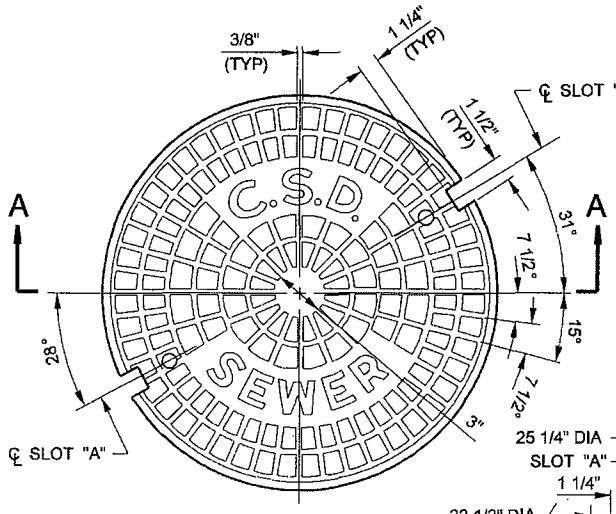
   CASE I SHALL NOT BE USED FOR COVER ON PIPE LESS THAN 12'.

   CASE II SHALL NOT BE USED FOR COVER ON PIPE MORE THAN 12'.

9. RISER SECTIONS 60" THROUGH 96" I.D. SHALL BE REINFORCED IN ACCORDANCE WITH ASTM C 478 AND SHALL HAVE THE FOLLOWING MINIMUM WALL THICKNESS (t).

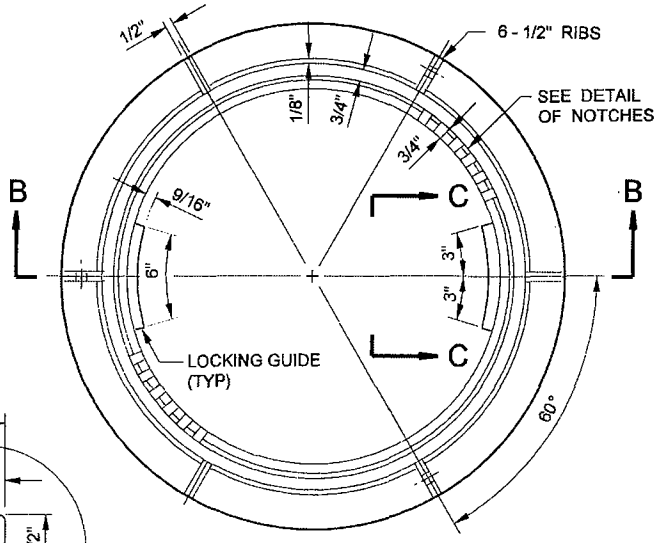
   60" I.D. - 5"; 72" I.D. - 6"; 84" I.D. - 7"; 96" I.D. - 8".

10. THE TOP PORTION OF THE PIPES WITHIN THE MANHOLE SHALL BE CUT OUT AS NECESSARY TO PROVIDE A CIRCULAR OPENING BETWEEN THE PIPE ENDS OF AT LEAST 54" IN THE 60" DIAMETER MANHOLE AND 66" IN THE 72" DIAMETER MANHOLE, 78" IN THE 84" DIAMETER MANHOLE AND 90" IN THE 96" DIAMETER MANHOLE. THE CUT ENDS SHALL BE PLASTERED SMOOTH WITH CEMENT MORTAR FOR CONCRETE PIPE AND EPOXY FOR CLAY PIPE. THE CIRCULAR OPENING SHALL BE CUT PRIOR TO INSTALLATION OF THE RISER SECTIONS.

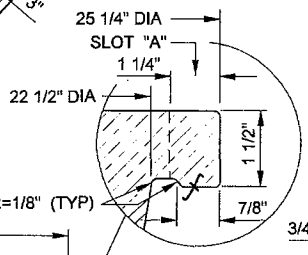


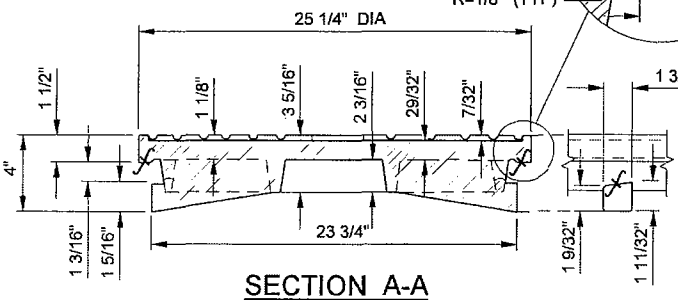
PLAN OF COVER

TOP VIEW

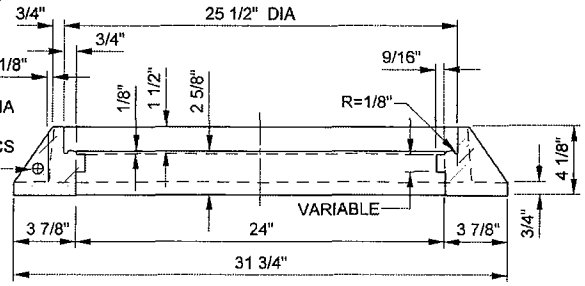


PLAN OF FRAME



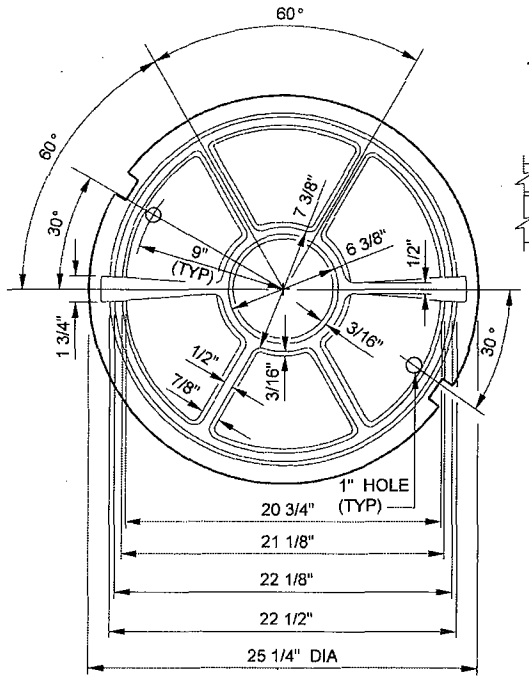


SECTION A-A



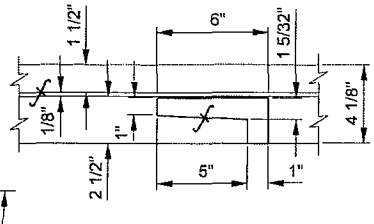
SECTION B-B

END VIEW
COVER LUG

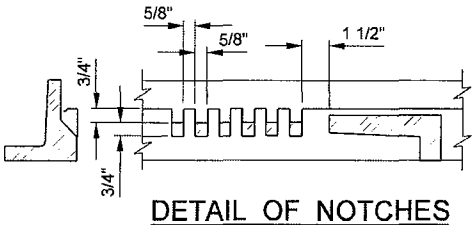


PLAN OF COVER

BOTTOM VIEW



SIDE VIEW C-C
LOCKING GUIDE



DETAIL OF NOTCHES

NOTES:

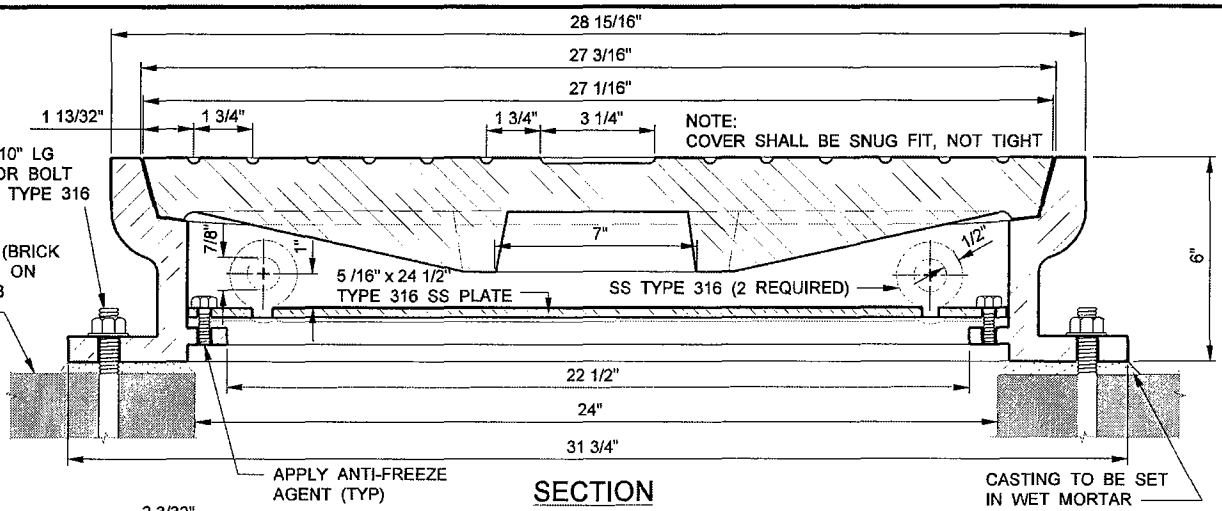
1. CAST IRON USED SHALL CONFORM WITH ASTM A-48 CLASS 35B.
2. FRAME AND COVER SHALL BE COATED WITH ASPHALTUM OR BITUMINOUS PAINT AFTER TESTING AND INSPECTION.
3. FRAME AND COVER SHALL BE TESTED FOR ACCURATE FIT PRIOR TO DELIVERY AND SHALL BE MARKED IN SETS.
4. ALL CASTINGS SHALL COMPLY WITH SECTION 206-3 OF THE STANDARD SPECIFICATIONS.

COUNTY SANITATION DISTRICTS OF LOS ANGELES COUNTY
OFFICE OF CHIEF ENGINEER

STEPHEN R. MAGUIN
CHIEF ENGINEER

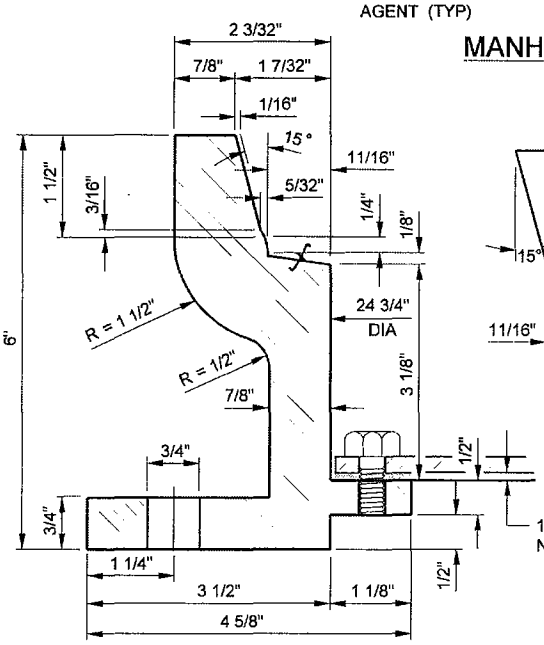
STANDARD 24" LOCKING MANHOLE FRAME AND COVER

STANDARD DRAWING
2006 EDITION
S - a - 2 0 7
SHEET 1 OF 1

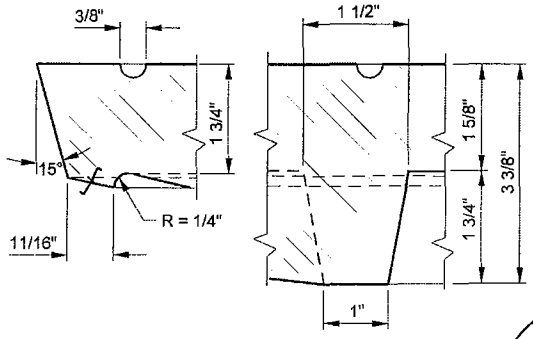


SECTION

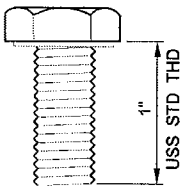
MANHOLE FRAME AND COVER



SECTION A-A

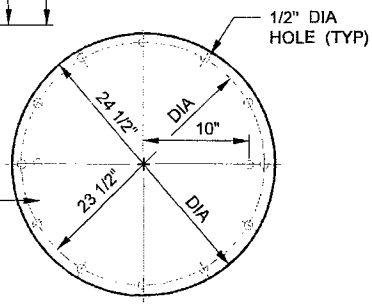


SECTION B-B



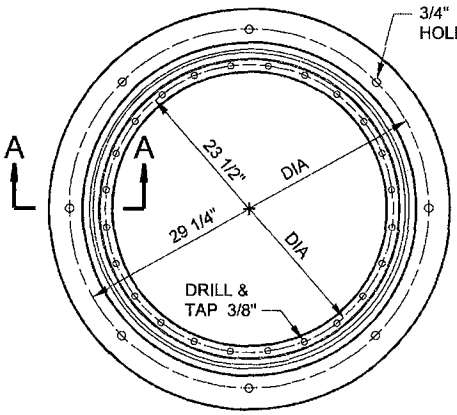
3/8" x 1" TYPE 316
SS CAP SCREW
(12 REQUIRED)

1 1/8" WIDE BY 1/8"
NEONPRENE GASKET

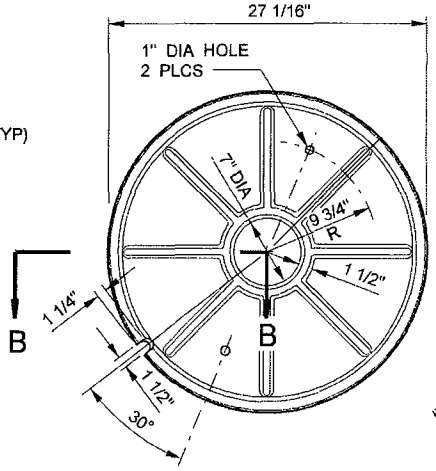


5/16" TYPE 316
SS PLATE

PRESSURE PLATE

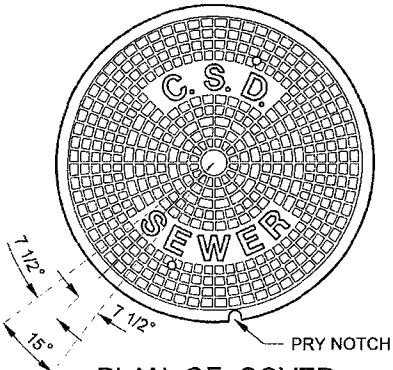


PLAN OF FRAME



PLAN OF COVER

BOTTOM VIEW



PLAN OF COVER

TOP VIEW

NOTE:
FOR NOTES SEE S-a-207.

COUNTY SANITATION DISTRICTS OF LOS ANGELES COUNTY

OFFICE OF CHIEF ENGINEER

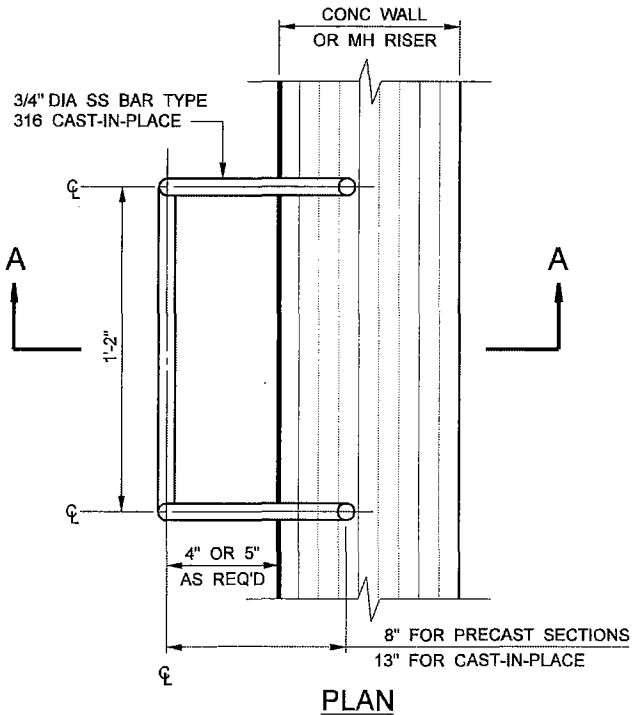
STEPHEN R. MAGUIN
CHIEF ENGINEER

STANDARD 24" PRESSURE MANHOLE FRAME AND COVER

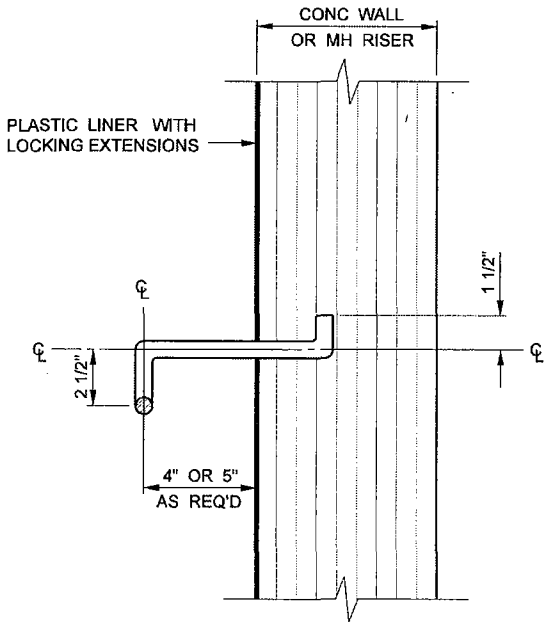
STANDARD DRAWING
2006 EDITION

S - a - 2 0 8

SHEET 1 OF 1

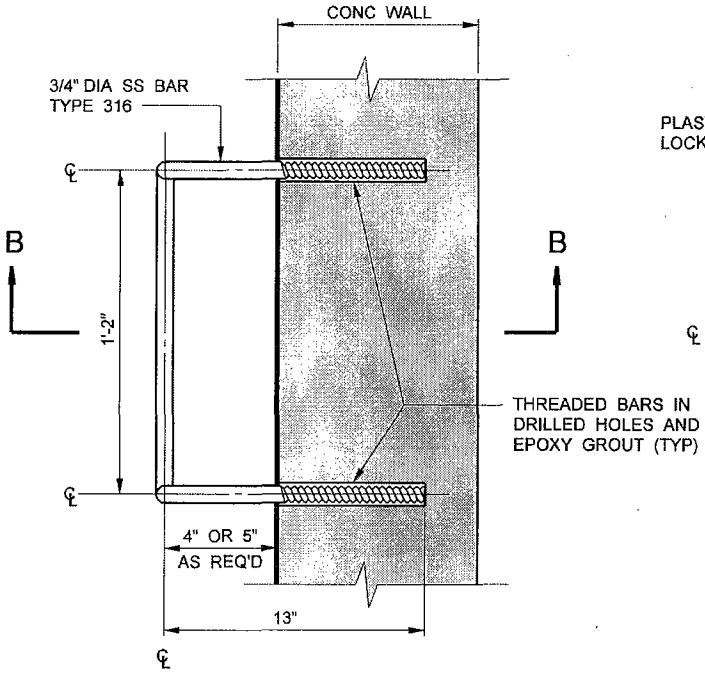


PLAN

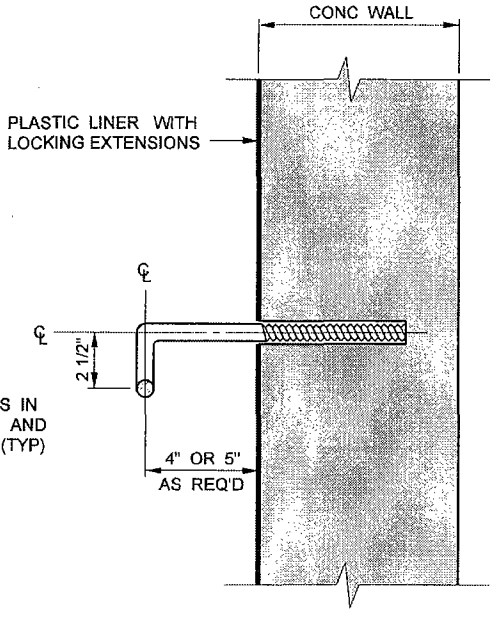


SECTION A-A

TYPE I MANHOLE STEP



PLAN



SECTION B-B

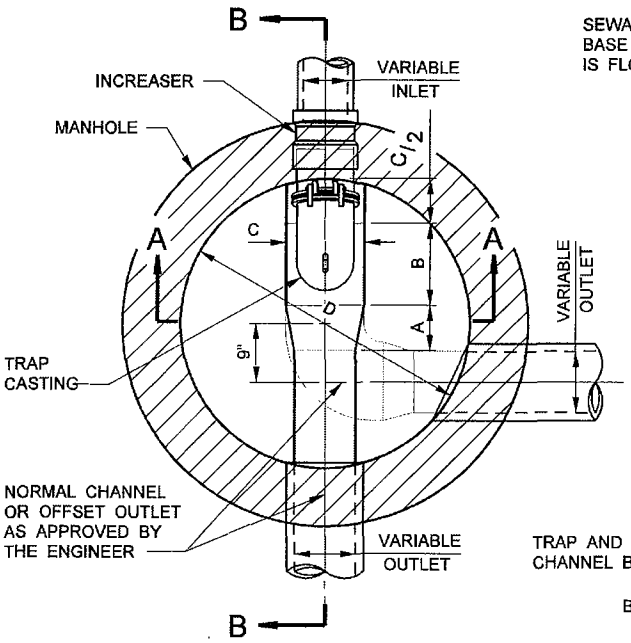
TYPE II MANHOLE STEP

COUNTY SANITATION DISTRICTS OF LOS ANGELES COUNTY
OFFICE OF CHIEF ENGINEER

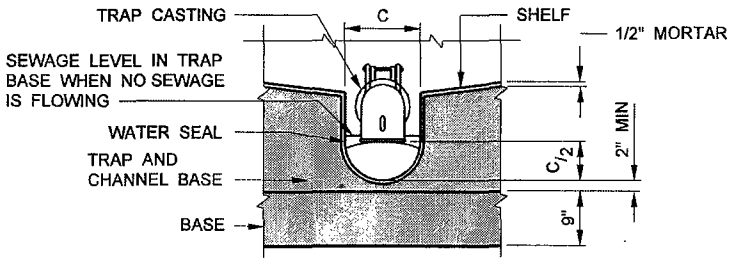
STEPHEN R. MAGUIN
CHIEF ENGINEER

STANDARD MANHOLE STEP

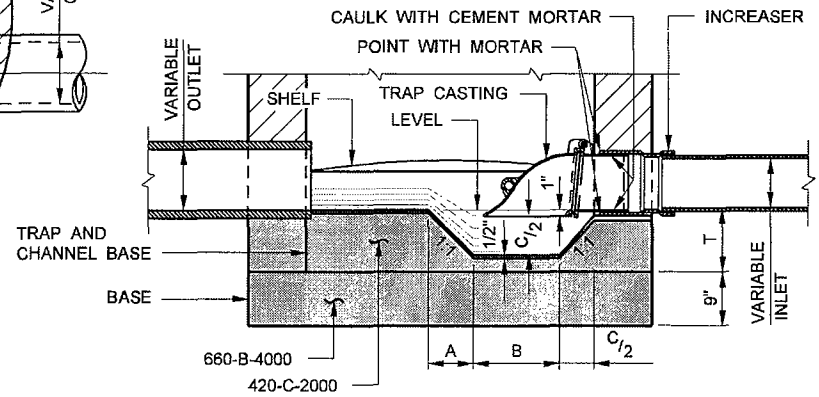
STANDARD DRAWING
2006 EDITION
S - a - 2 0 9
SHEET 1 OF 1



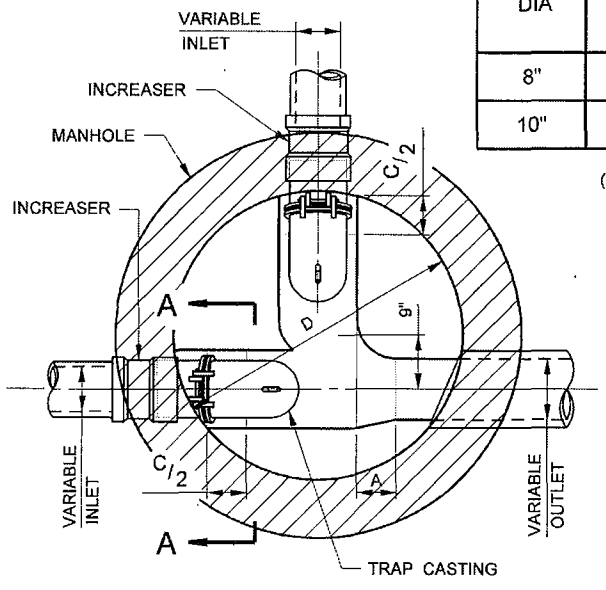
PLAN - SINGLE TRAP BASE



SECTION A-A



SECTION B-B



PLAN - DOUBLE TRAP BASE

TABLE OF DIMENSIONS						
INLET DIA	INLET INCREASER	TRAP SIZE	TRAP PER	DIA OF MANHOLE BASE (D)		
				OUTLET DIAMETER		
				8"	10"	12"
8"	8" x 10"	10"	S-a-211	4'	4'	4'
10"	10" x 12"	12"	S-a-211	—	4'	4'

(FOR 12" INLETS AND LARGER SEE CONSTRUCTION DRAWINGS)

TRAP BASE DIMENSIONS					
TRAP DIA	A	B	C	A + B + C/2	T MIN
10"	7 1/2"	14 1/2"	13"	28 1/2"	9"
12"	8 1/2"	16 1/2"	15"	32 1/2"	10"

NOTES:

1. WHERE A TRAP IS NECESSARY IN AN EXISTING STRUCTURE, BREAK OUT CONCRETE AND CONSTRUCT NEW BASE.
2. FOR GENERAL NOTES AND CONSTRUCTION DETAILS OF BRICKWORK, SEE S-a-201.

COUNTY SANITATION DISTRICTS OF LOS ANGELES COUNTY
OFFICE OF CHIEF ENGINEER

STEPHEN R. MAGUIN
CHIEF ENGINEER

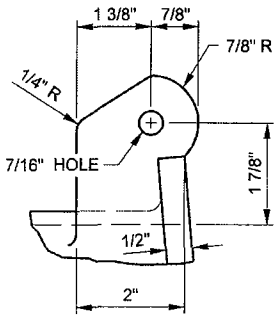
STANDARD TRAP MANHOLE BASE

STANDARD DRAWING
2006 EDITION
S - a - 2 1 0
SHEET 1 OF 1

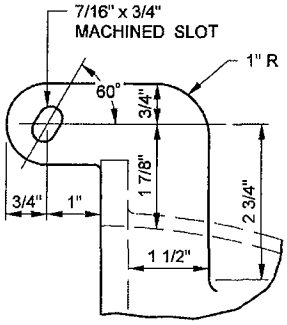
DIMENSIONS OF CASTINGS				
INLET DIA	A	B	R	L
10"	6"	9"	11"	14 3/4"
12"	7"	11"	13"	17 3/4"

NOTES:

1. CAST IRON USED SHALL CONFORM WITH ASTM A-48 CLASS 35B.
2. FLANGES OF CASTING SHALL BE MACHINED FACED.
3. CASTINGS SHALL BE DIPPED TWICE IN HOT ASPHALT PAINT.
4. RUBBER GASKET SHALL BE NEOPRENE 35-50 SHORE.



DETAIL "A"



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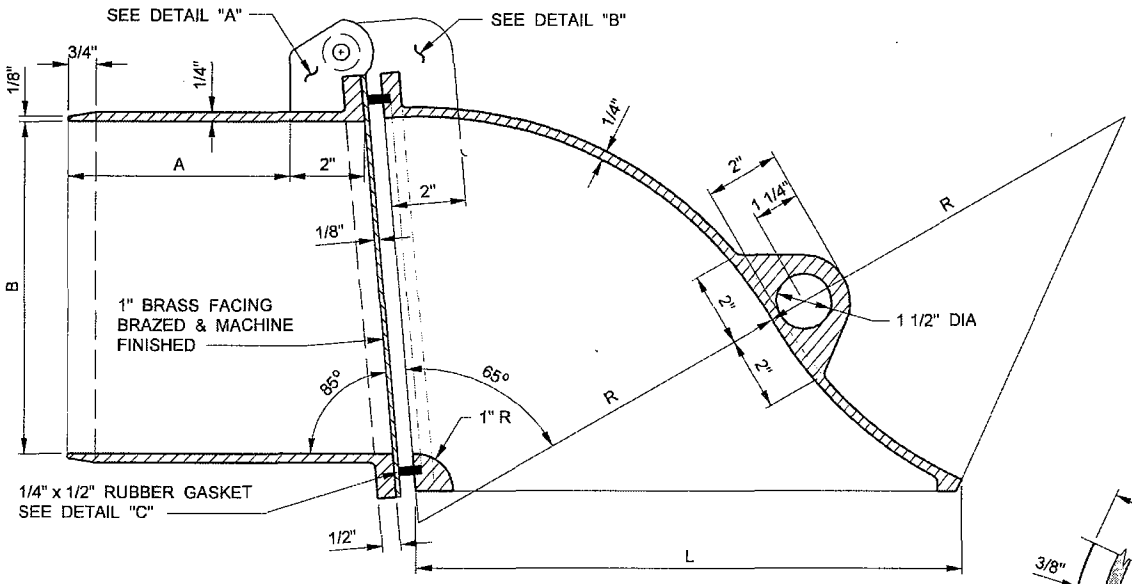
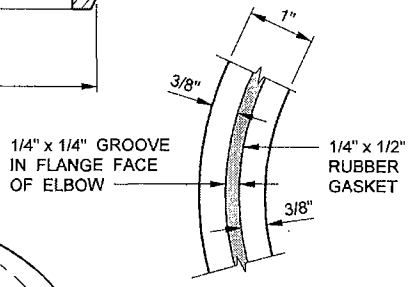


SECTIONAL VIEW



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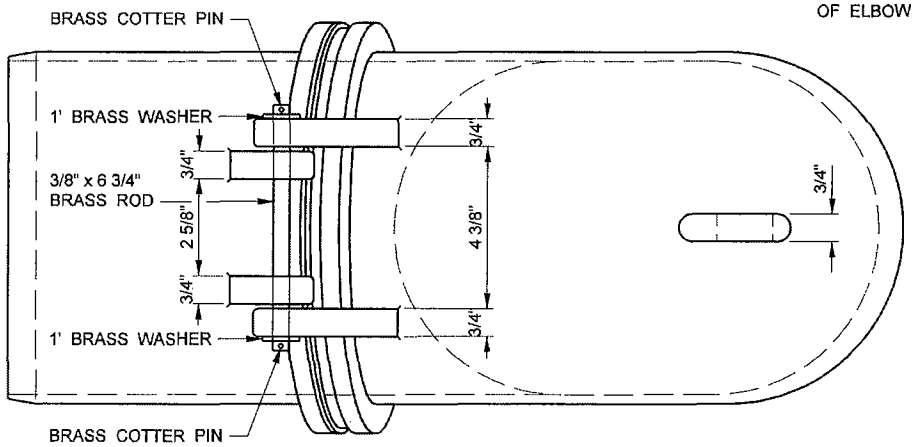


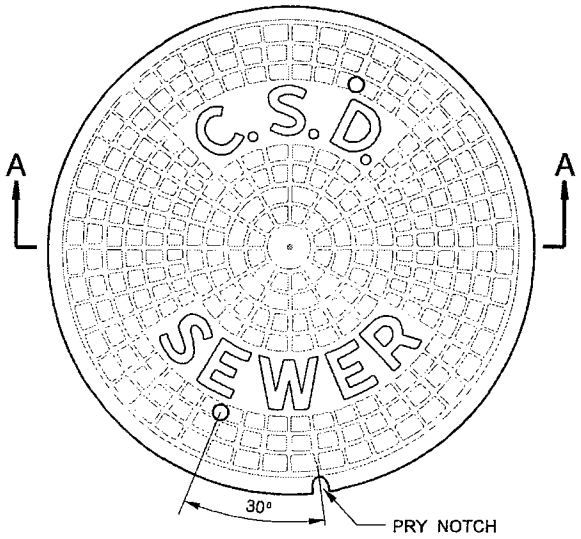
PLAN VIEW

COUNTY SANITATION DISTRICTS OF LOS ANGELES COUNTY
OFFICE OF CHIEF ENGINEER

STEPHEN R. MAGUIN
CHIEF ENGINEER

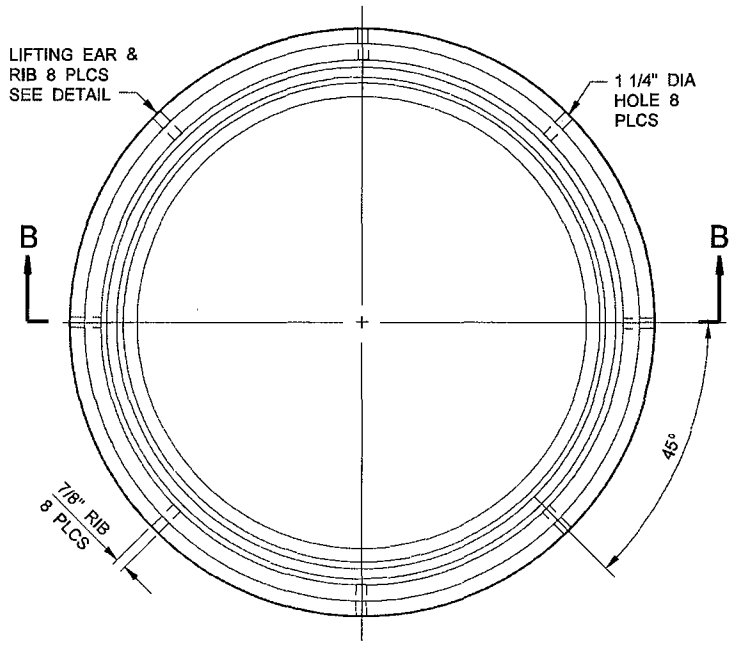
STANDARD TRAP CASTING

STANDARD DRAWING
2006 EDITION
S - a - 2 1 1
SHEET 1 OF 1

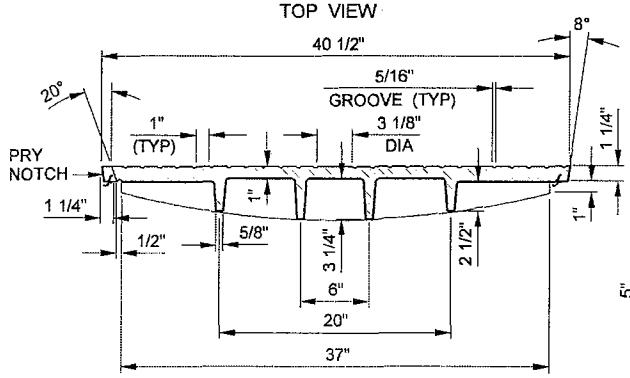


PLAN OF COVER

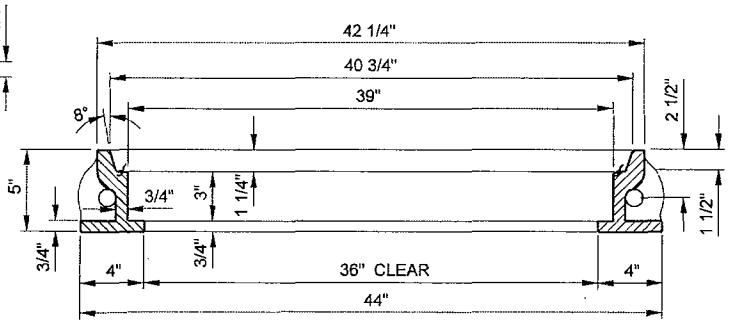
TOP VIEW



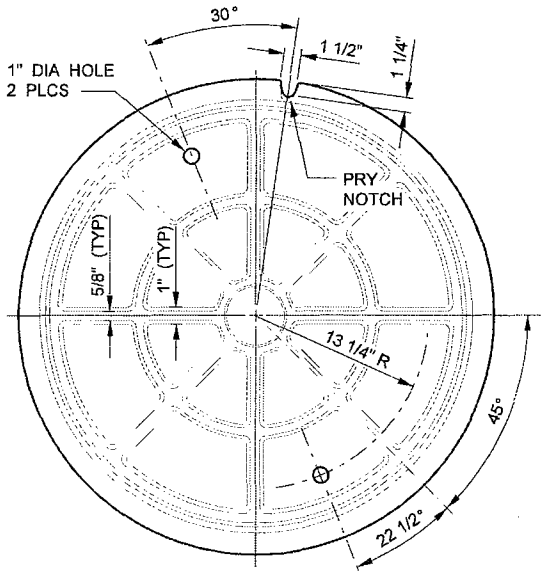
PLAN OF FRAME



SECTION A-A

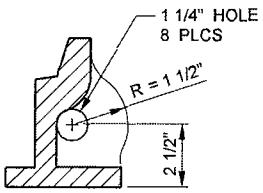


SECTION B-B



PLAN OF COVER

BOTTOM VIEW



DETAIL

LIFTING EAR & RIB

NOTES:

1. CAST IRON USED SHALL CONFORM WITH ASTM A-48 CLASS 35B.
2. FRAME AND COVER SHALL BE COATED WITH ASPHALTUM OR BITUMINOUS PAINT AFTER TESTING AND INSPECTION.
3. FRAME AND COVER SHALL BE TESTED FOR ACCURATE FIT PRIOR TO DELIVERY AND SHALL BE MARKED IN SETS.
4. ALL CASTINGS SHALL COMPLY WITH SECTION 206-3 OF THE STANDARD SPECIFICATIONS.

COUNTY SANITATION DISTRICTS OF LOS ANGELES COUNTY

OFFICE OF CHIEF ENGINEER

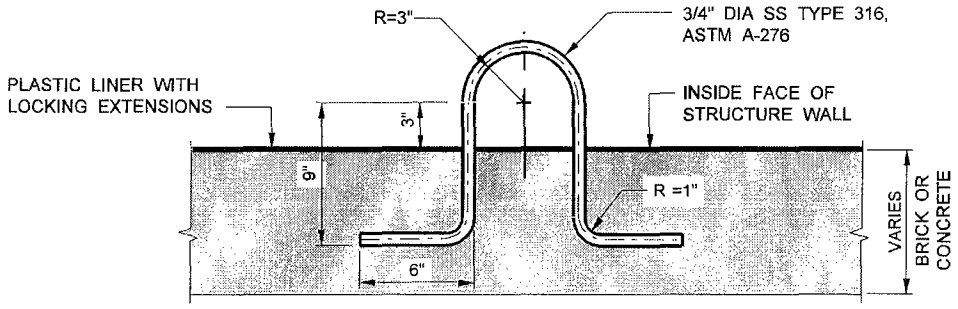
STEPHEN R. MAGUIN
CHIEF ENGINEER

STANDARD 36" MANHOLE FRAME AND COVER

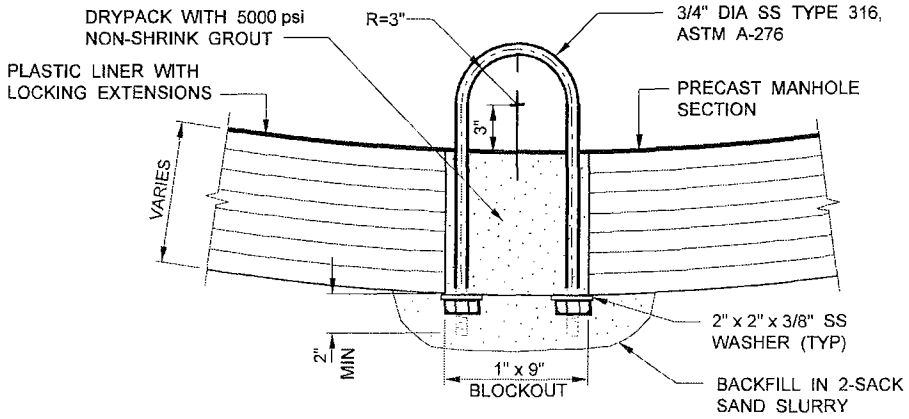
STANDARD DRAWING
2006 EDITION

S - a - 2 1 5

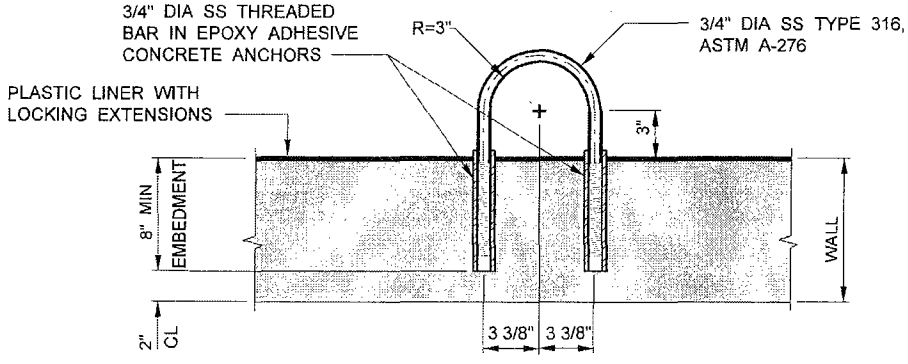
SHEET 1 OF 1



FOR CONCRETE STRUCTURE OR
TYPE "A" MANHOLE WALL



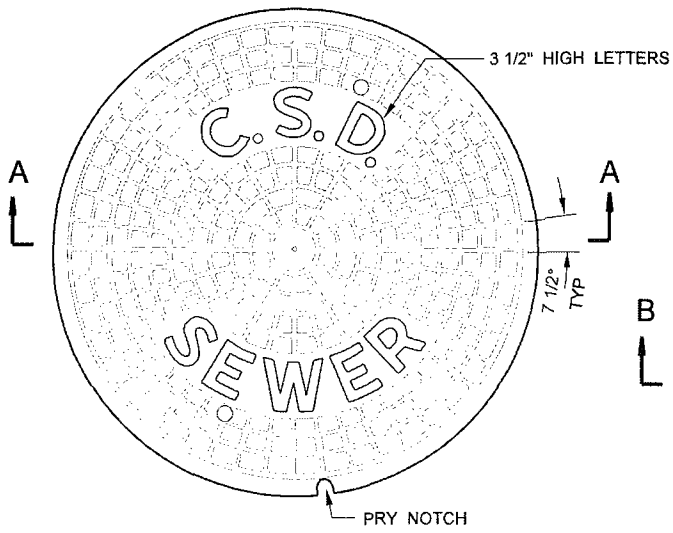
FOR PRECAST MANHOLE SECTION OR
CONCRETE WALL LESS THAN 8"



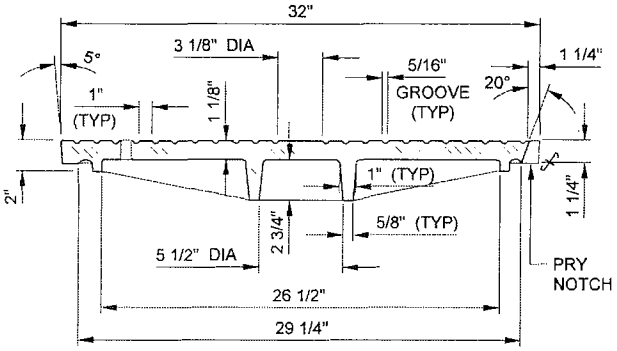
ALTERNATE PULL RING FOR
CONCRETE STRUCTURE

COUNTY SANITATION DISTRICTS OF LOS ANGELES COUNTY
OFFICE OF CHIEF ENGINEER

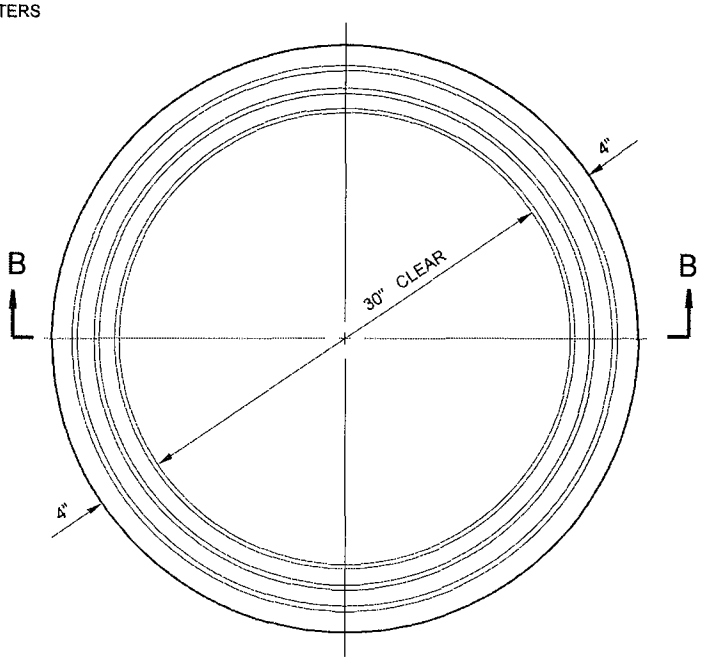
STEPHEN R. MAGUIN CHIEF ENGINEER	STANDARD PULL RING	STANDARD DRAWING 2006 EDITION S - a - 2 2 0 SHEET 1 OF 1



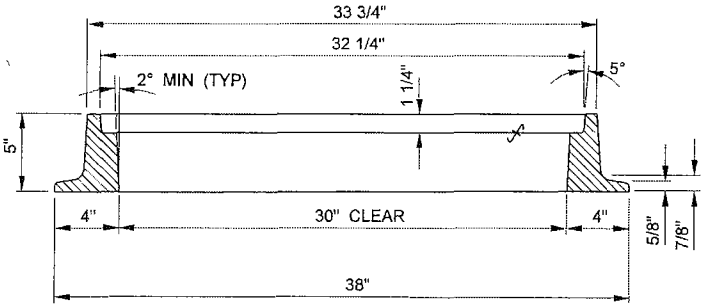
PLAN OF COVER
TOP VIEW



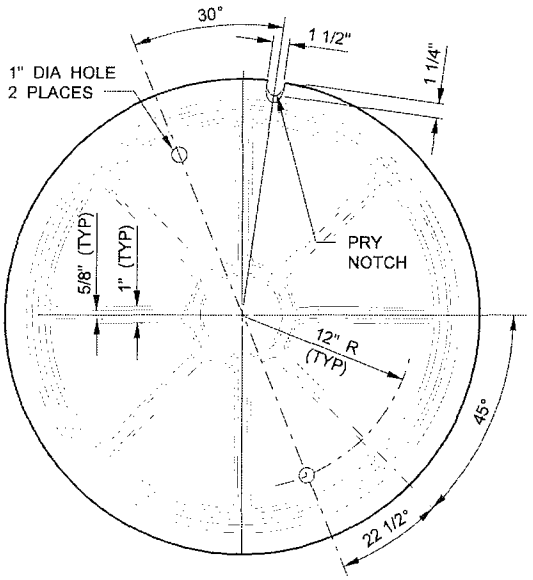
SECTION A-A



PLAN OF FRAME



SECTION B-B



PLAN OF COVER
BOTTOM VIEW

NOTES:

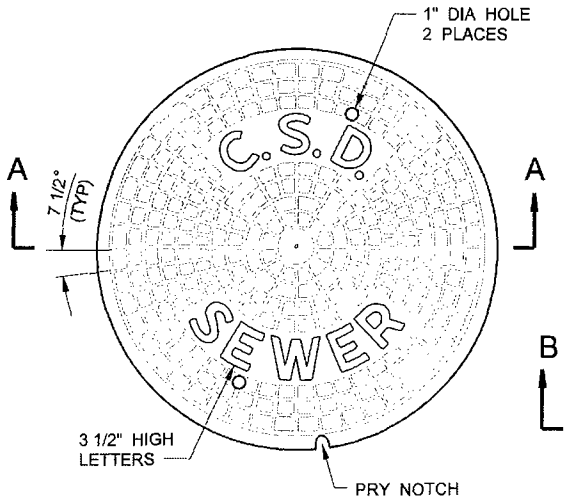
1. CAST IRON USED SHALL CONFORM WITH ASTM A-48 CLASS 35B.
2. FRAME AND COVER SHALL BE COATED WITH ASPHALTUM OR BITUMINOUS PAINT AFTER TESTING AND INSPECTION.
3. FRAME AND COVER SHALL BE TESTED FOR ACCURATE FIT PRIOR TO DELIVERY AND SHALL BE MARKED IN SETS.
4. ALL CASTINGS SHALL COMPLY WITH SECTION 206-3 OF THE STANDARD SPECIFICATIONS.

COUNTY SANITATION DISTRICTS OF LOS ANGELES COUNTY
OFFICE OF CHIEF ENGINEER

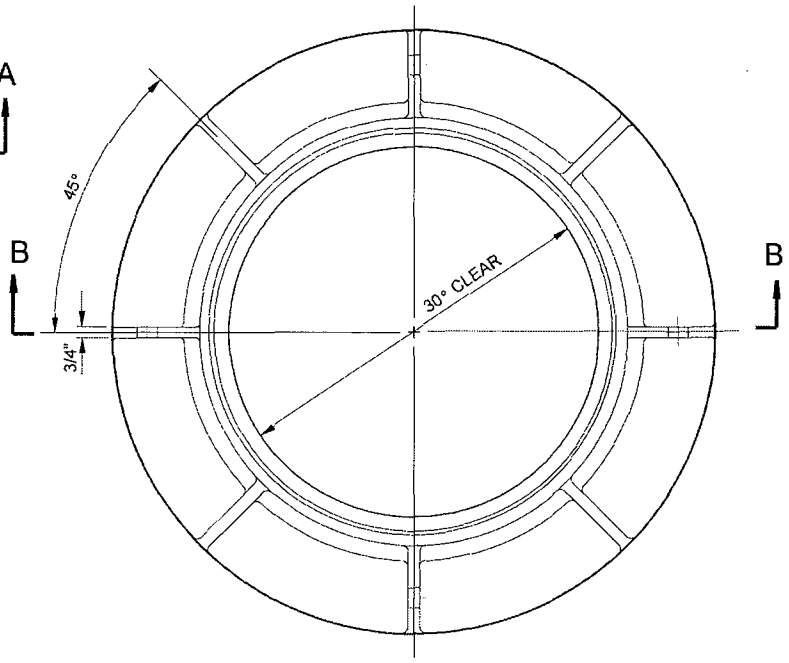
STEPHEN R. MAGUIN
CHIEF ENGINEER

STANDARD 30" MANHOLE FRAME AND COVER

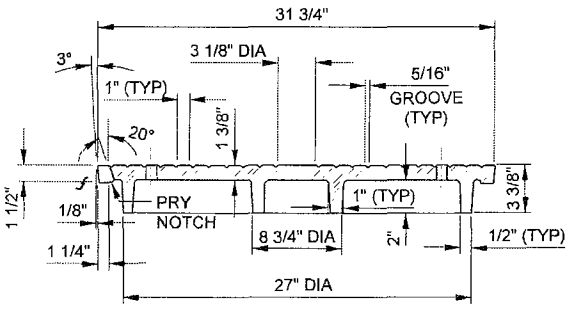
STANDARD DRAWING
2006 EDITION
S - a - 2 2 3
SHEET 1 OF 1



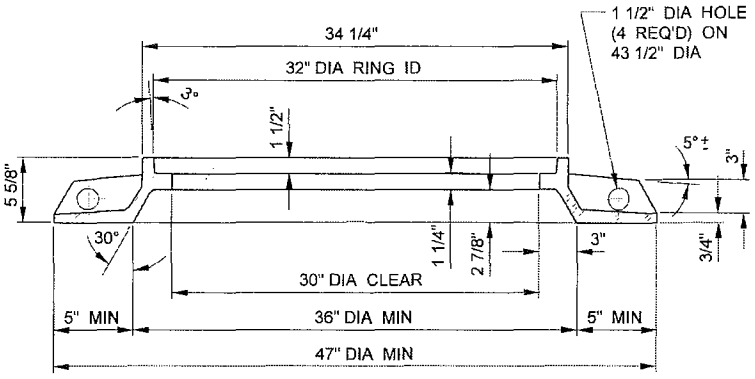
PLAN OF COVER
TOP VIEW



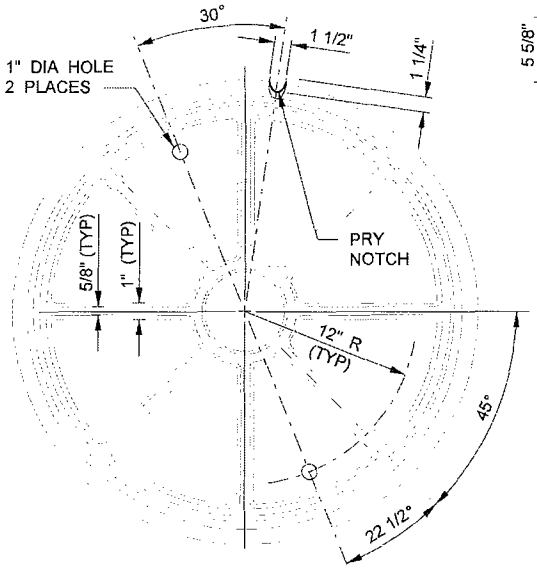
PLAN OF FRAME



SECTION A-A



SECTION B-B



PLAN OF COVER
BOTTOM VIEW

NOTES:

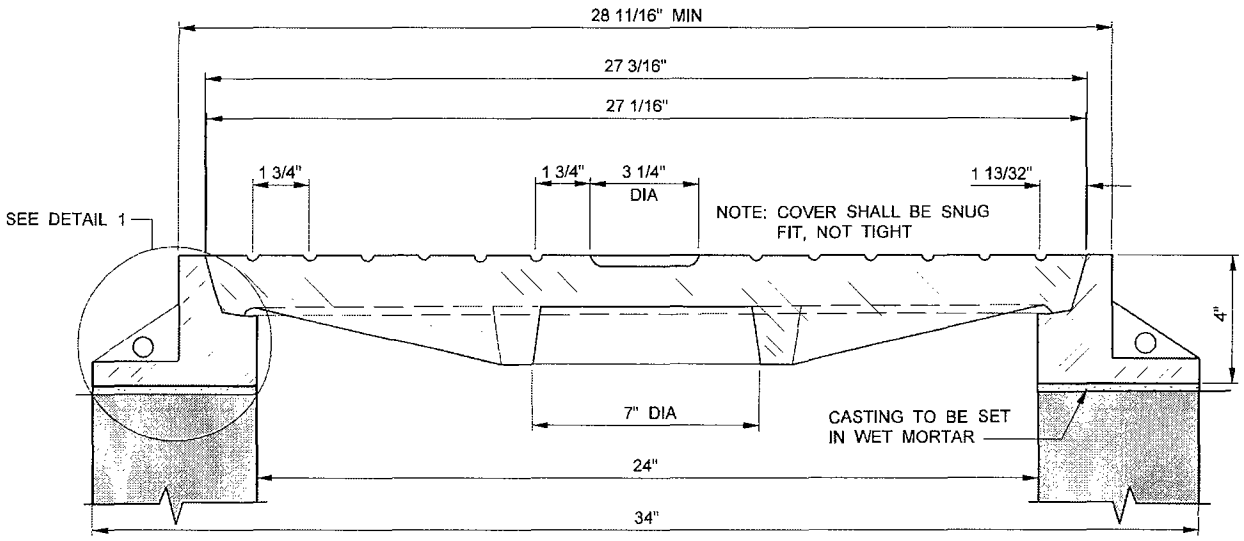
1. CAST IRON USED SHALL CONFORM WITH ASTM A-48 CLASS 35B.
2. FRAME AND COVER SHALL BE COATED WITH ASPHALTUM OR BITUMINOUS PAINT AFTER TESTING AND INSPECTION.
3. FRAME AND COVER SHALL BE TESTED FOR ACCURATE FIT PRIOR TO DELIVERY AND SHALL BE MARKED IN SETS.
4. ALL CASTINGS SHALL COMPLY WITH SECTION 206-3 OF THE STANDARD SPECIFICATIONS.

COUNTY SANITATION DISTRICTS OF LOS ANGELES COUNTY
OFFICE OF CHIEF ENGINEER

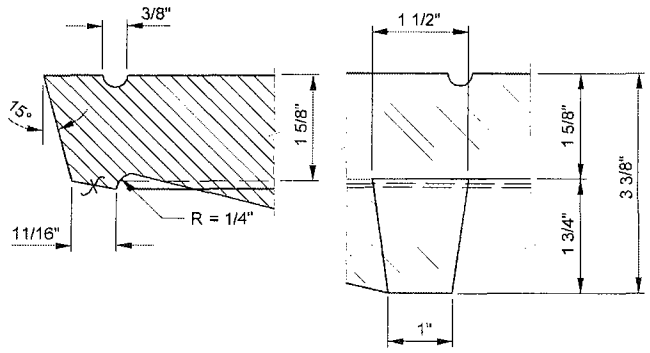
STEPHEN R. MAGUIN
CHIEF ENGINEER

STANDARD 36" MANHOLE FRAME WITH 30" COVER

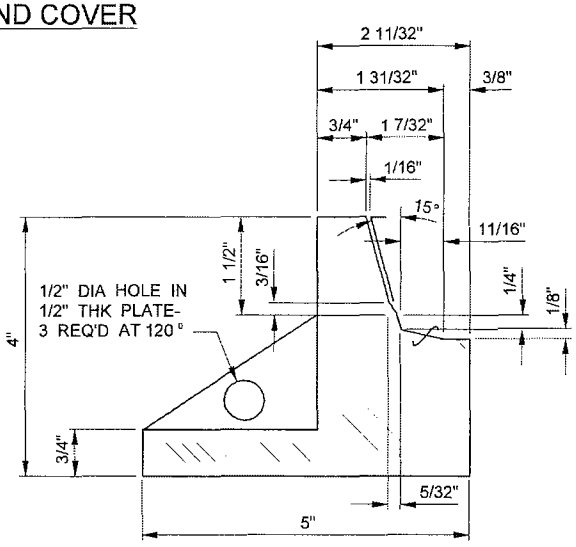
STANDARD DRAWING
2006 EDITION
S - a - 2 2 6
SHEET 1 OF 1



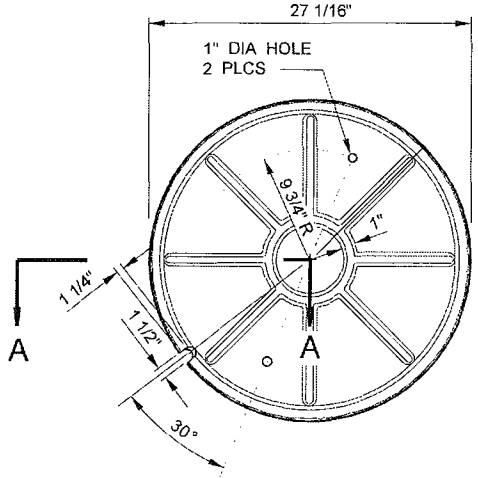
SECTION
MANHOLE FRAME AND COVER



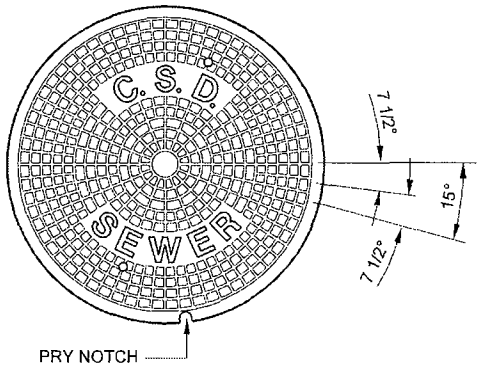
SECTION A-A



DETAIL 1



PLAN OF COVER
BOTTOM VIEW



PLAN OF COVER
TOP VIEW

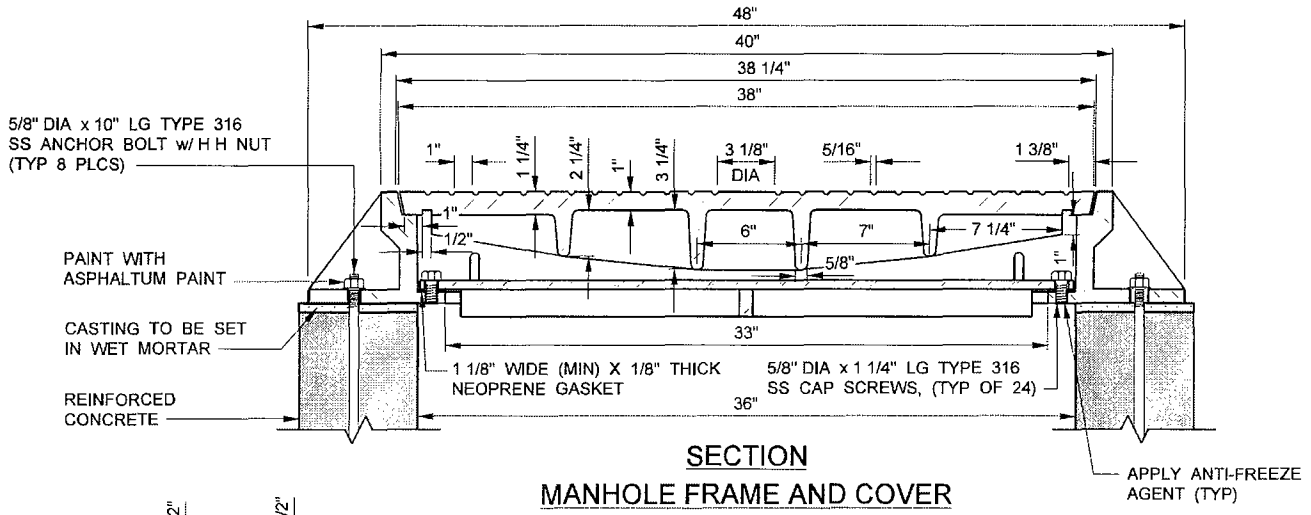
NOTE:
FOR NOTES SEE S-a-207.

COUNTY SANITATION DISTRICTS OF LOS ANGELES COUNTY
OFFICE OF CHIEF ENGINEER

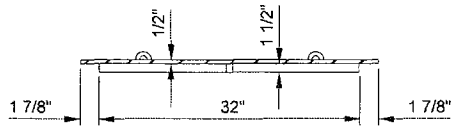
STEPHEN R. MAGUIN
CHIEF ENGINEER

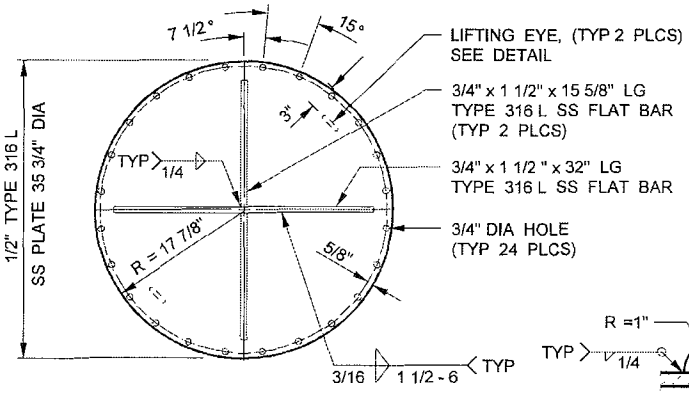
STANDARD 24" TRAFFIC MANHOLE FRAME AND COVER

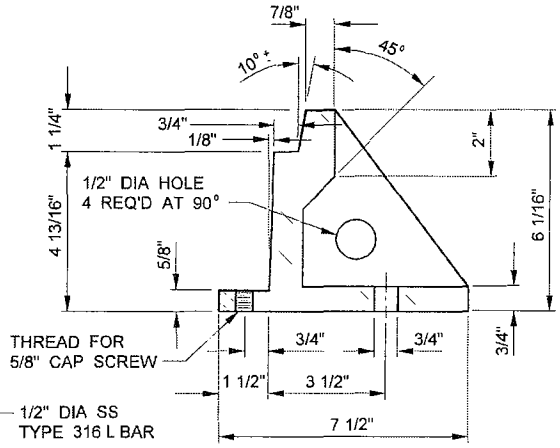
STANDARD DRAWING
2006 EDITION
S - a - 2 2 8
SHEET 1 OF 1



SECTION
MANHOLE FRAME AND COVER



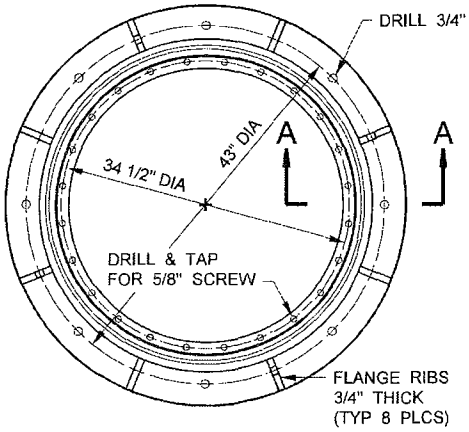




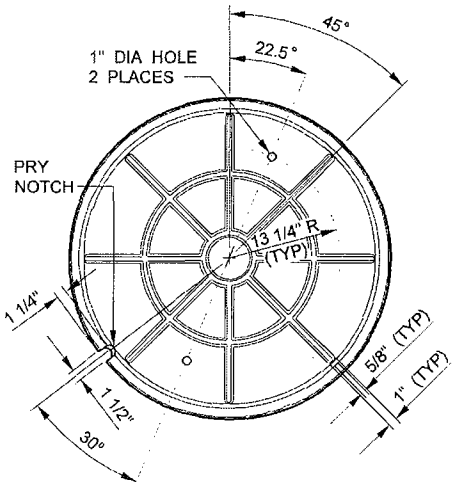
PRESSURE PLATE
BOTTOM VIEW

DETAIL- LIFTING EYE

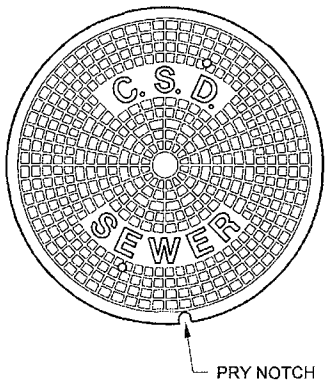
SECTION A-A



PLAN OF FRAME



PLAN OF COVER
BOTTOM VIEW



PLAN OF COVER
TOP VIEW

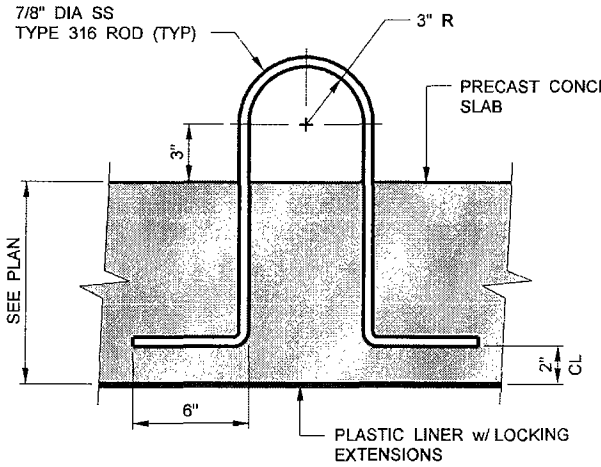
NOTE:
FOR NOTES SEE S-a-207.

COUNTY SANITATION DISTRICTS OF LOS ANGELES COUNTY
OFFICE OF CHIEF ENGINEER

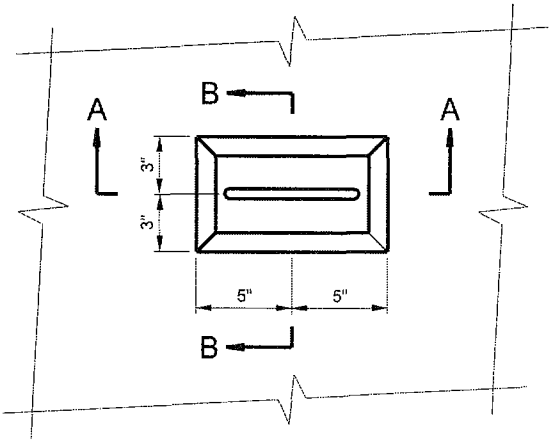
STEPHEN R. MAGUIN
CHIEF ENGINEER

STANDARD 36" PRESSURE MANHOLE FRAME AND COVER

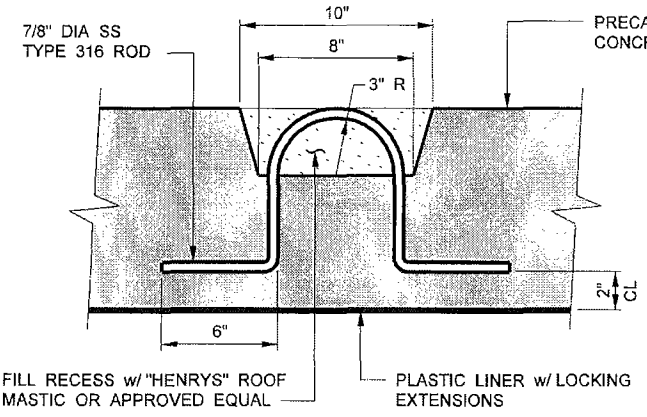
STANDARD DRAWING
2006 EDITION
S - a - 2 2 9
SHEET 1 OF 1



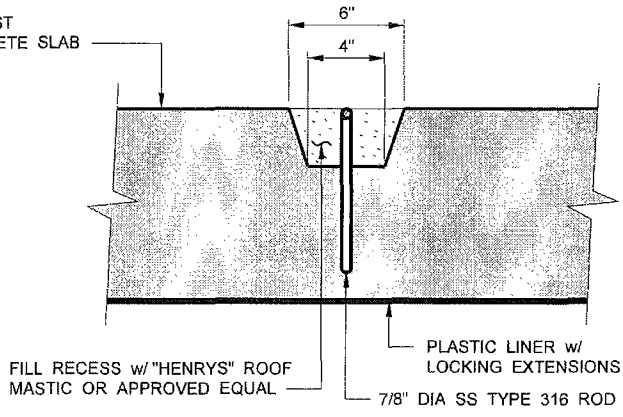
TYPE I LIFTING EYE DETAIL



PLAN



SECTION A-A



SECTION B-B

TYPE II LIFTING EYE DETAIL

(FOR COVER LESS THAN 12" THICK)

COUNTY SANITATION DISTRICTS OF LOS ANGELES COUNTY

OFFICE OF CHIEF ENGINEER

STEPHEN R. MAGUIN
CHIEF ENGINEER

STANDARD LIFTING EYE

STANDARD DRAWING
2006 EDITION

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SHEET 1 OF 1