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

S-a-79	STANDARD METHOD OF INSTALLING SADDLES
S-a-86	STANDARD METHOD FOR CONNECTION TO PIPES AND STRUCTURES
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S-a-203	STANDARD MANHOLE, TYPE "C"
S-a-204	STANDARD MANHOLE, TYPE "D"
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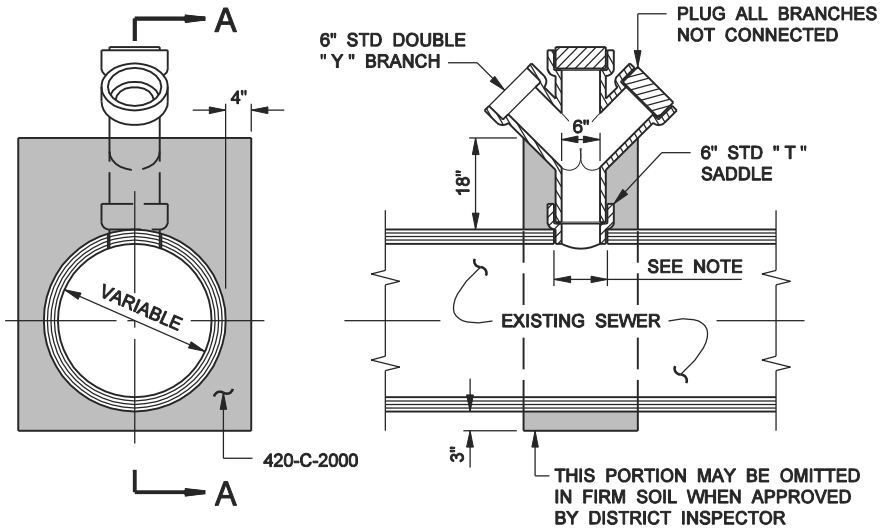
S-a-229	STANDARD 36" PRESSURE MANHOLE FRAME AND COVER
S-a-230	STANDARD LIFTING EYE

COUNTY SANITATION DISTRICTS OF LOS ANGELES COUNTY
OFFICE OF CHIEF ENGINEER

STEPHEN R. MAGUIN
CHIEF ENGINEER

STANDARD METHOD OF INSTALLING SADDLES

STANDARD DRAWING
2009 EDITION
S - a - 7 9
SHEET 1 OF 1

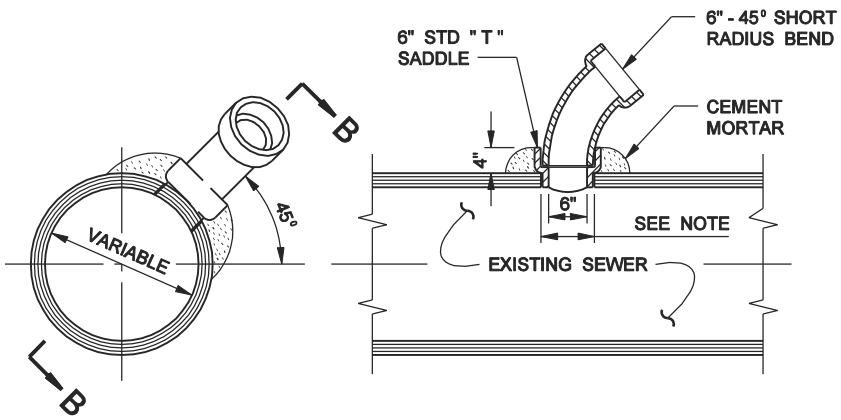


END VIEW

SECTION A-A

STANDARD "T" SADDLE

(SHALLOW LINE)



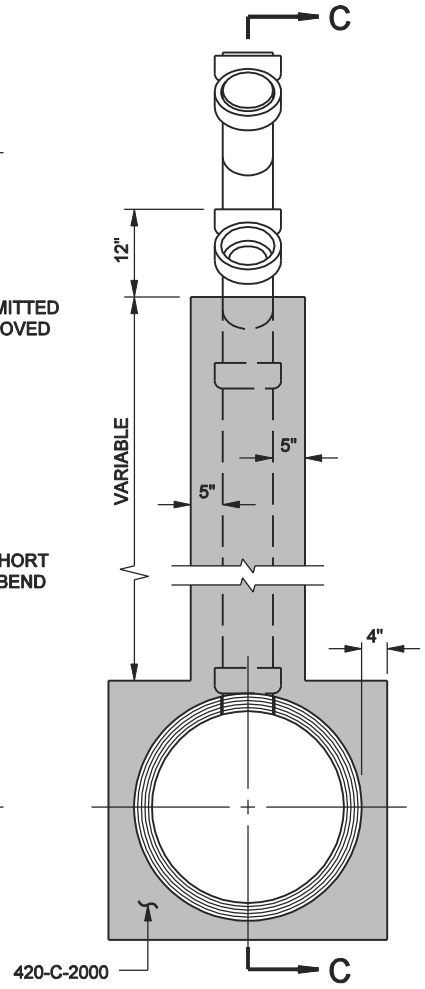
END VIEW

SECTION B-B

STANDARD "Y" SADDLE

NOTE:

CORE DRILLING PER SHALL MAKE HOLES IN RC PIPES AND IN NRCP AND VCP PIPES LARGER THAN 18" S-a-86. HOLES IN NRCP AND VCP 18" AND SMALLER MAY BE MADE BY CHIPPING THE PIPE.



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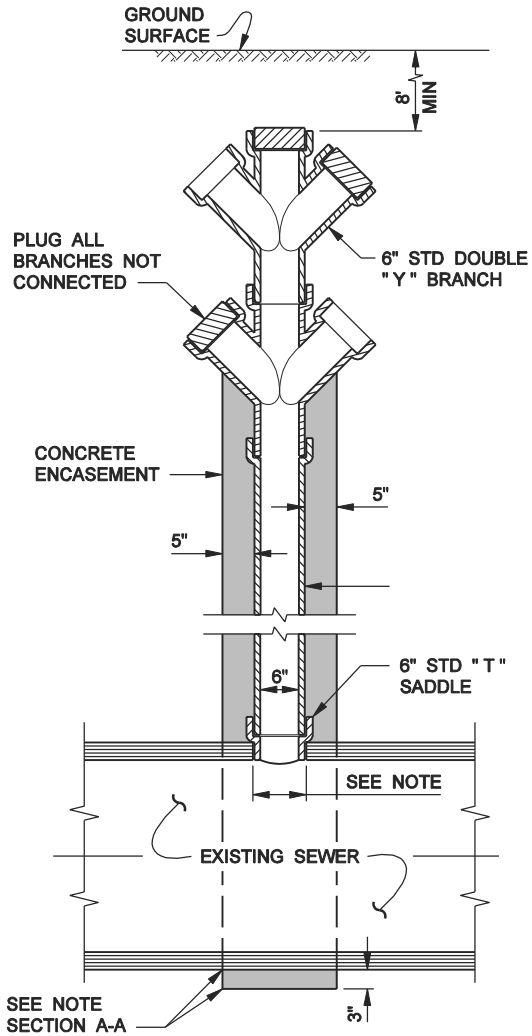
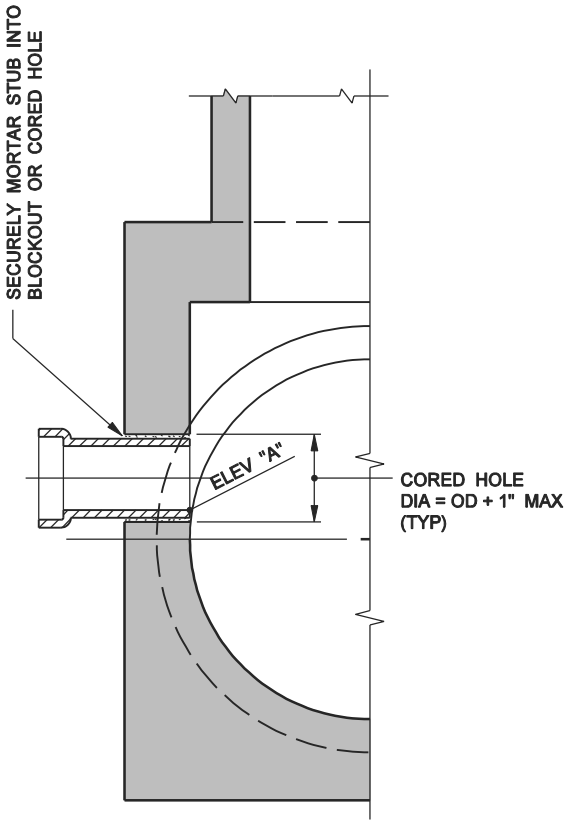


SECTION C-C

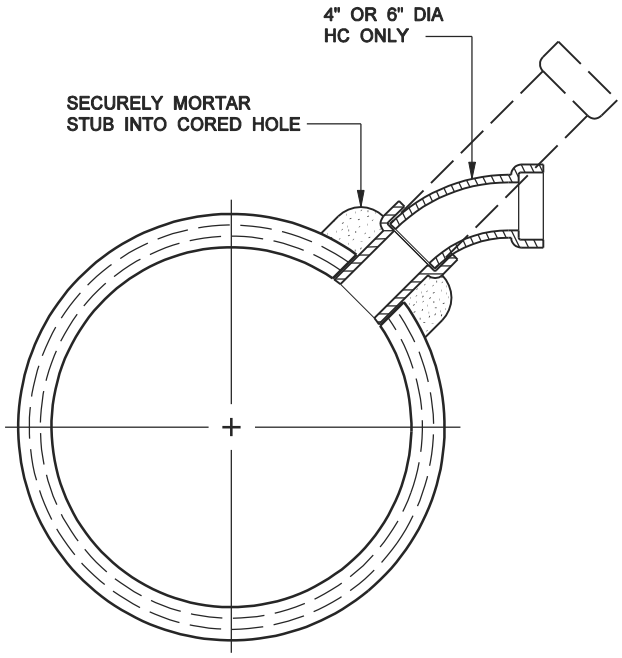
STANDARD "T" SADDLE

(DEEP LINE)

THIS DRAWING DOES NOT APPLY TO CONNECTIONS TO LINED PIPE



CONNECTION TO REINFORCED CONCRETE STRUCTURE



CONNECTION TO RCP (ALL SIZES) & NRCP & VCP 21" OR LARGER

NOTES:

1. ELEVATION "A" FOR LATERAL SEWER CONNECTIONS SHALL BE AS SHOWN ON APPROVED LATERAL SEWER DRAWINGS.
2. HOUSE CONNECTION TO THE PIPE SHALL BE AS SHOWN ON S-a-79 EXCEPT AS SHOWN HEREON.
3. THE CORED HOLE SHALL BE MADE WITH EQUIPMENT SPECIALLY DESIGNED TO CUT A SMOOTH HOLE WITHOUT SPALLING OR DAMAGE TO THE REINFORCING STEEL, PIPE OR STRUCTURE.
4. THE CORING OF THE HOLE AND THE PLACING OF THE STUB SHALL BE DONE IN THE PRESENCE OF THE DISTRICT INSPECTOR.
5. NO CONNECTION SHALL BE MADE TO THE STUB UNTIL DISTRICT INSPECTOR HAS APPROVED THE STUB.

THIS DRAWING DOES NOT APPLY TO CONNECTIONS TO LINED PIPES OR STRUCTURES

COUNTY SANITATION DISTRICTS OF LOS ANGELES COUNTY
OFFICE OF CHIEF ENGINEER

STEPHEN R. MAGUIN
CHIEF ENGINEER

STANDARD METHOD FOR CONNECTION TO PIPES AND STRUCTURES

STANDARD DRAWING
2009 EDITION
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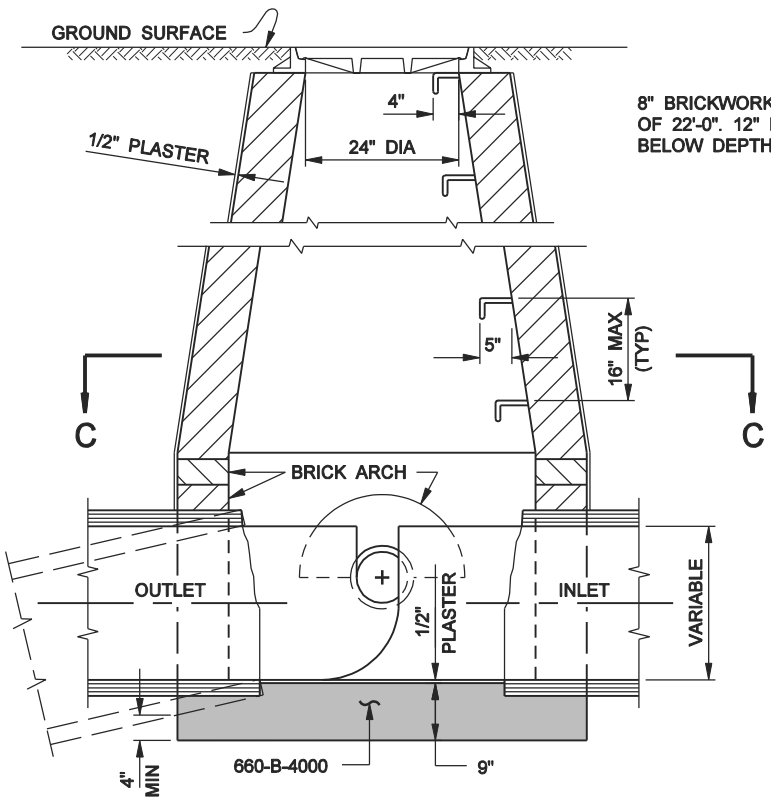
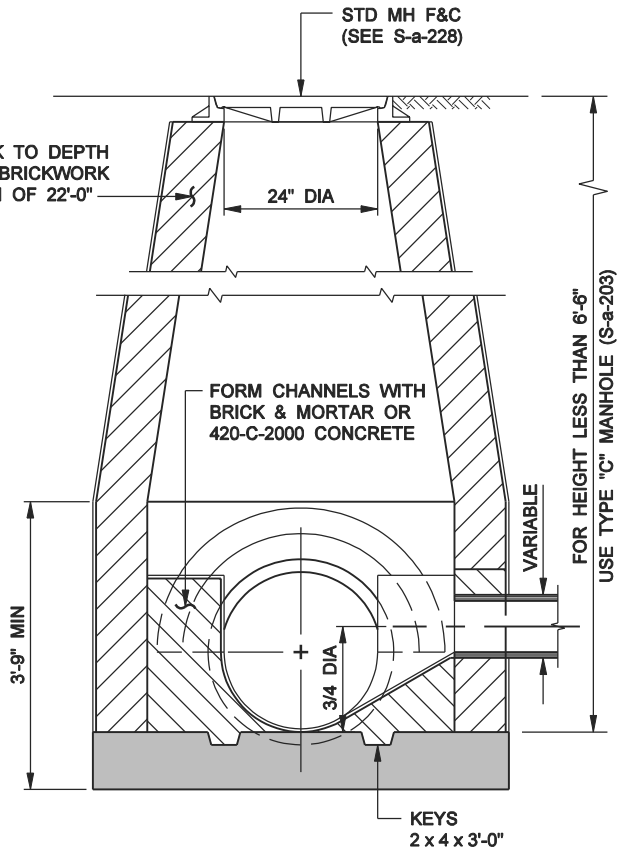
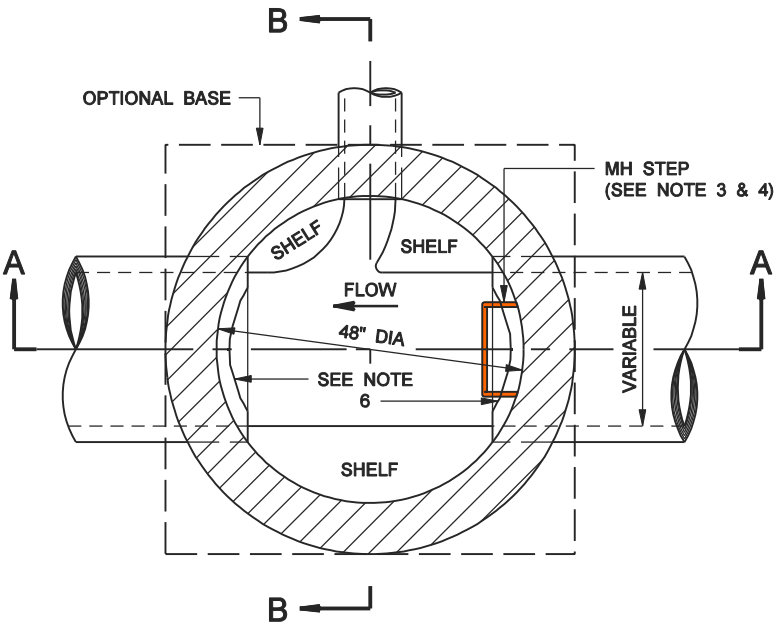
SHEET 1 OF 1



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.

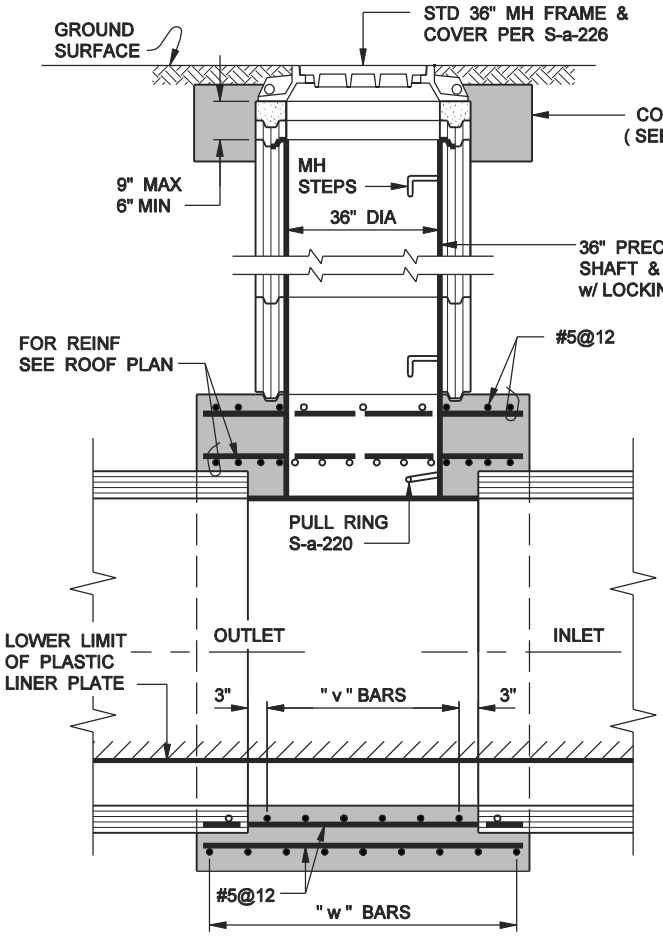
FOR 8" TO 30" PIPE

COUNTY SANITATION DISTRICTS OF LOS ANGELES COUNTY
OFFICE OF CHIEF ENGINEER

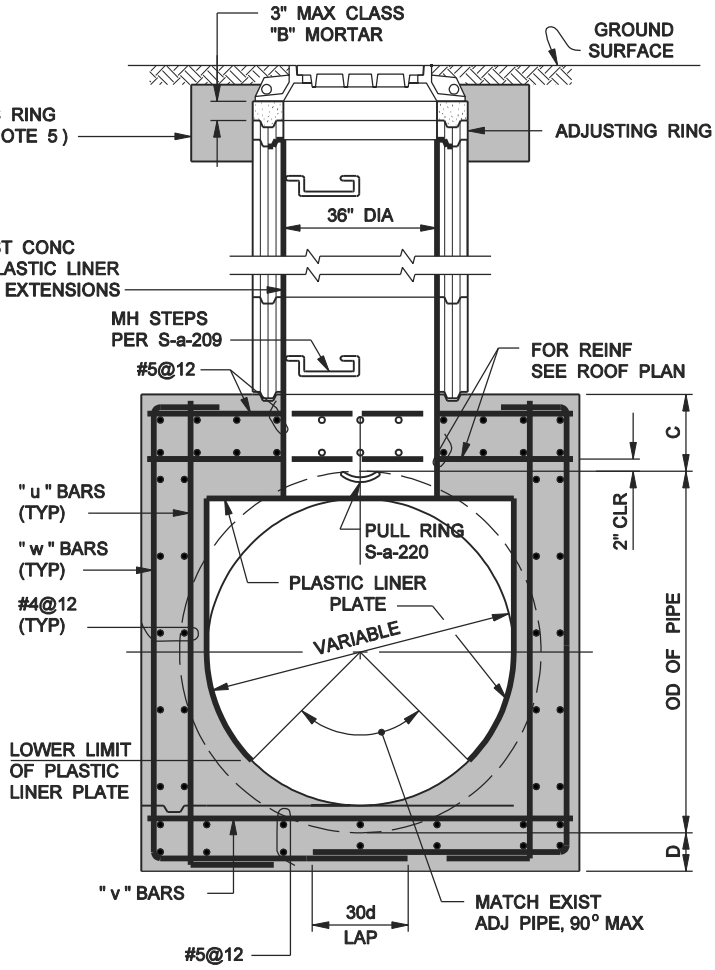
STEPHEN R. MAGUIN
CHIEF ENGINEER

STANDARD MANHOLE, TYPE "A"

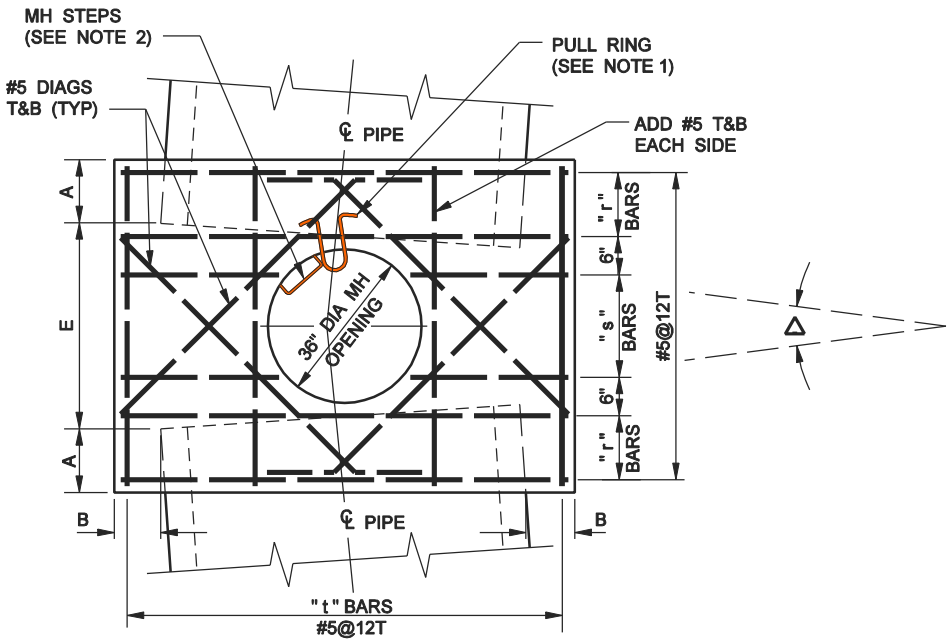
STANDARD DRAWING
2009 EDITION
S - a - 2 0 1
SHEET 1 OF 1



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 2009 EDITION S - a - 2 0 2 SHEET 1 OF 3

COUNTY SANITATION DISTRICTS OF LOS ANGELES COUNTY
OFFICE OF CHIEF ENGINEER

STEPHEN R. MAGUIN
CHIEF ENGINEER

STANDARD MANHOLE, TYPE "B"

STANDARD DRAWING
2009 EDITION
S - a - 2 0 2
SHEET 2 OF 3

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					

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.

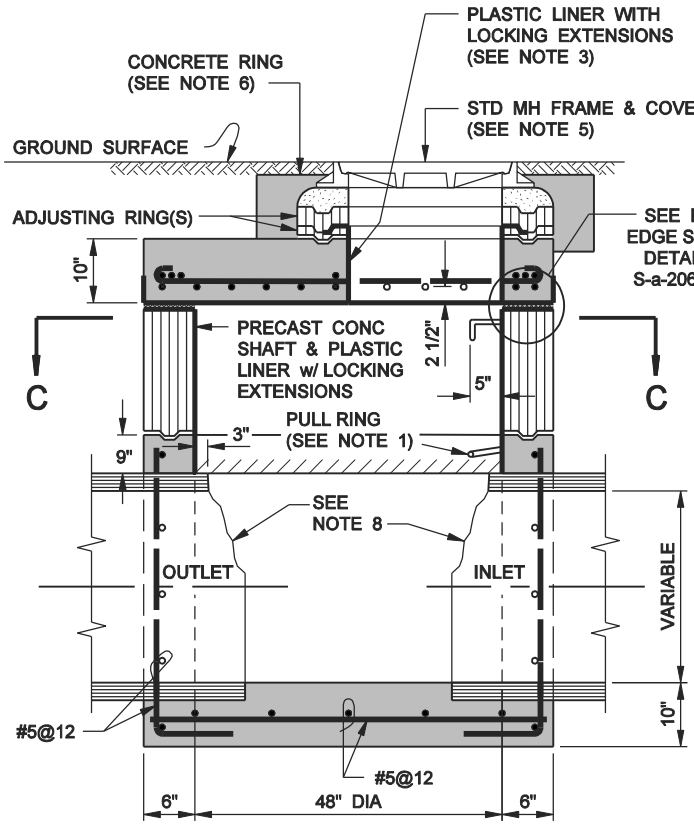
2. MANHOLE STEPS SHALL BE IN ACCORDANCE WITH S-a-209 AND SHALL BE UNIFORMLY SPACED NOT MORE THAN 16" APART. THE TOP STEP SHALL BE PLACED WITHIN 16" BELOW THE MANHOLE FRAME. THE BOTTOM MANHOLE STEP SHALL BE PLACED WITHIN 16" ABOVE THE TOP OF THE PIPE. THE MANHOLE STEP SHALL PROJECT 5". THE MANHOLE STEPS 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.

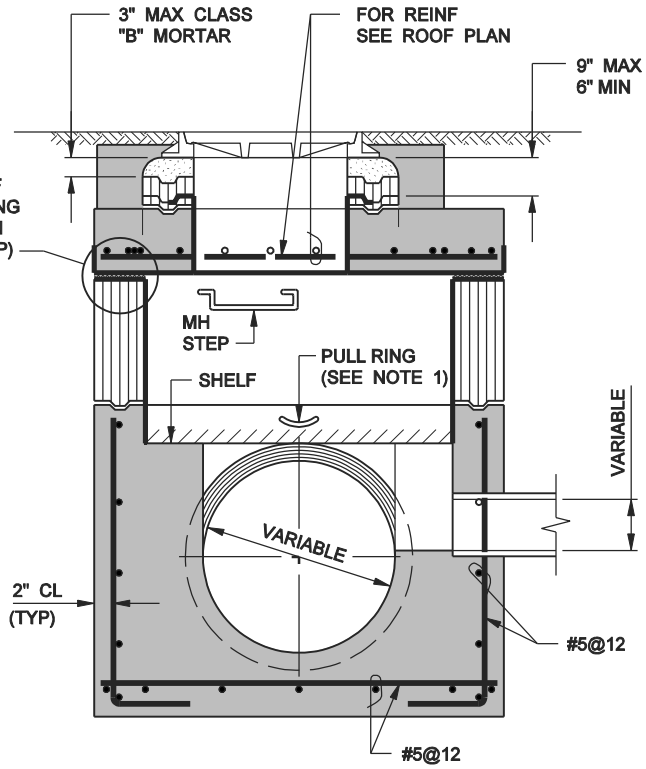
4. UNLESS OTHERWISE SPECIFIED, ALL CONCRETE SHALL BE 660-B-4000 AND ALL REINFORCING BARS SHALL BE DEFORMED BARS CONFORMING TO ASTM-A706 GRADE 60.

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.

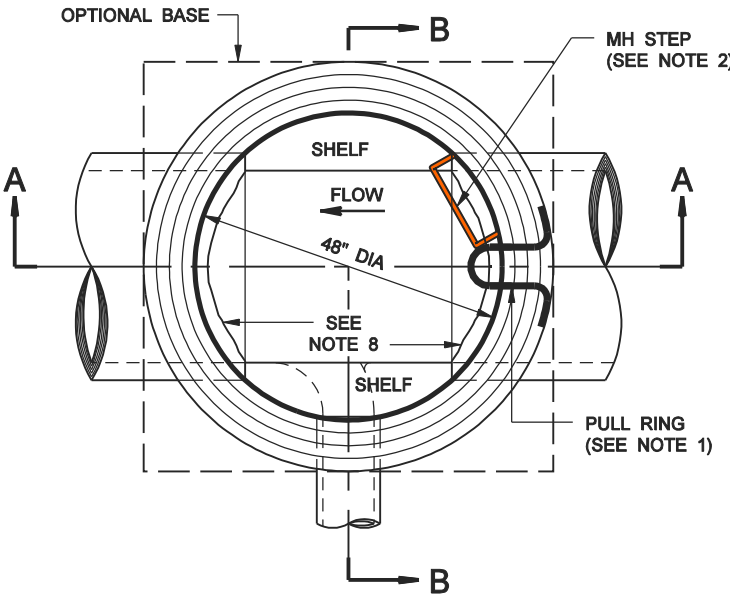
6. EXCEPT AS NOTED HEREON, THE PRECAST UNITS SHALL BE MANUFACTURED AND TESTED IN ACCORDANCE WITH ASTM C478. THE CURING OF THE PRECAST UNITS SHALL CONFORM TO SECTION 207-2.7 OF THE STANDARD SPECIFICATIONS. AS AN ALTERNATE, THE UNITS MAY BE CURED USING SATURATED STEAM FOR A MINIMUM OF 12 HOURS FOLLOWED 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.



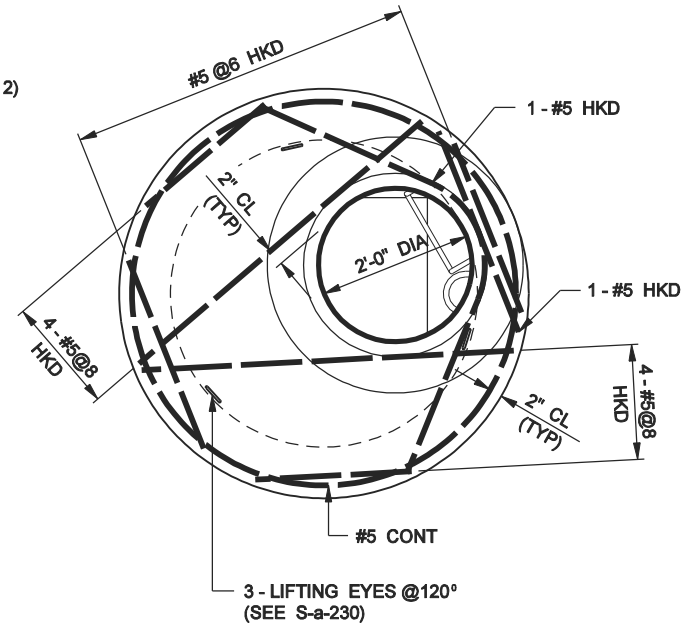
SECTION A-A



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 2009 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.

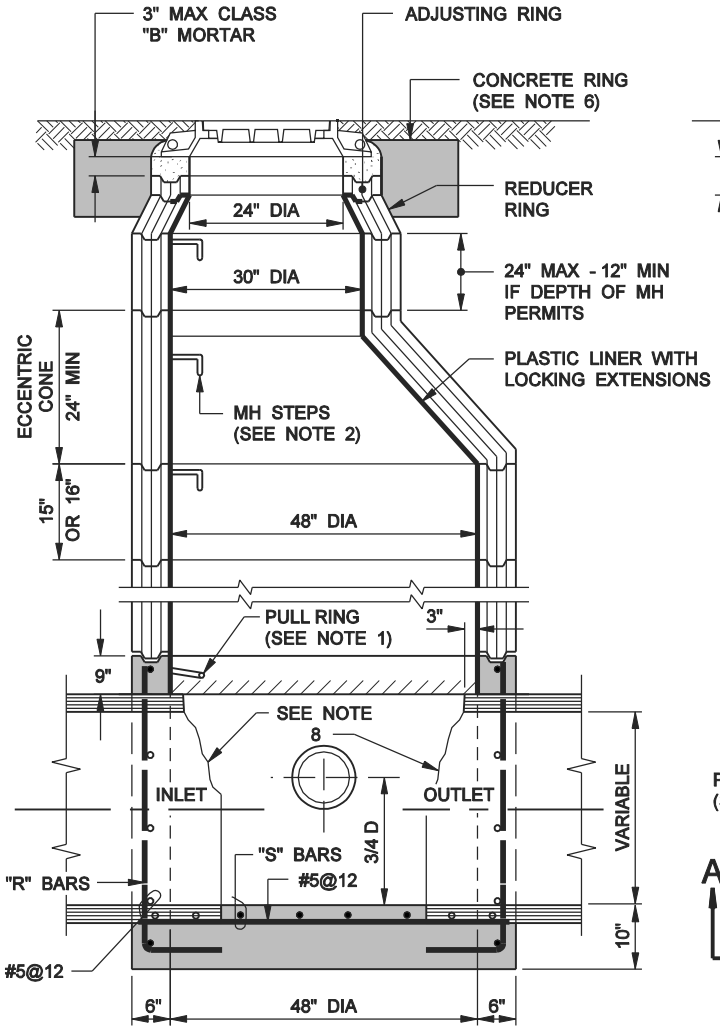
5. IN PAVED AREAS SUBJECT TO TRAFFIC, A 24" TRAFFIC MANHOLE FRAME AND COVER IN ACCORDANCE WITH S-a-228 SHALL BE PROVIDED. IN ALL OTHER AREAS, A 24" LOCKING MANHOLE FRAME AND COVER IN ACCORDANCE WITH S-a-207 SHALL BE PROVIDED.

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.

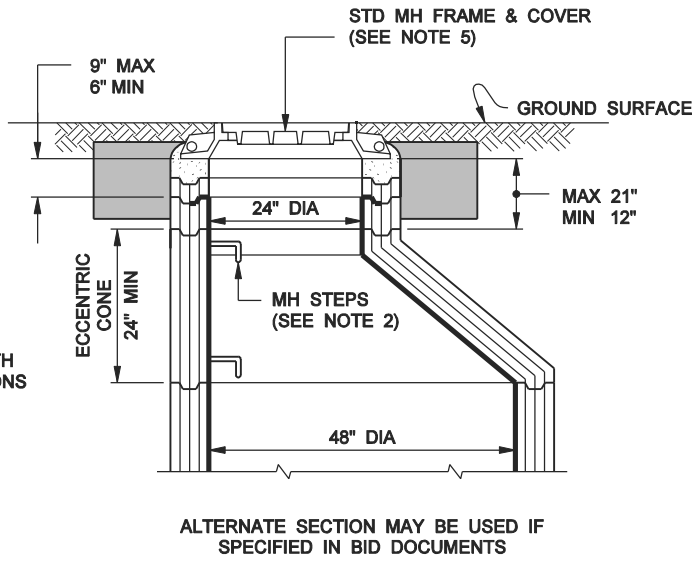
NOTES:

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.

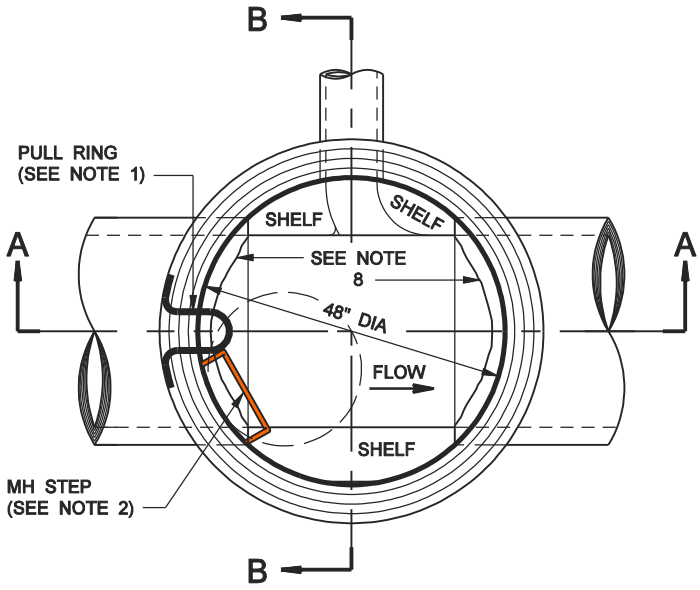
8. THE TOP PORTION OF THE PIPES WITHIN THE MANHOLE SHALL BE CUT OUT AS NECESSARY TO PROVIDE A CIRCULAR OPENING BETWEEN THE PIPE ENDS OF AT LEAST 42". THE CUT ENDS SHALL BE PLASTERED SMOOTH WITH CEMENT MORTAR FOR CONCRETE PIPE AND EPOXY FOR CLAY PIPE. THE CIRCULAR OPENING SHALL BE CUT PRIOR TO INSTALLATION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



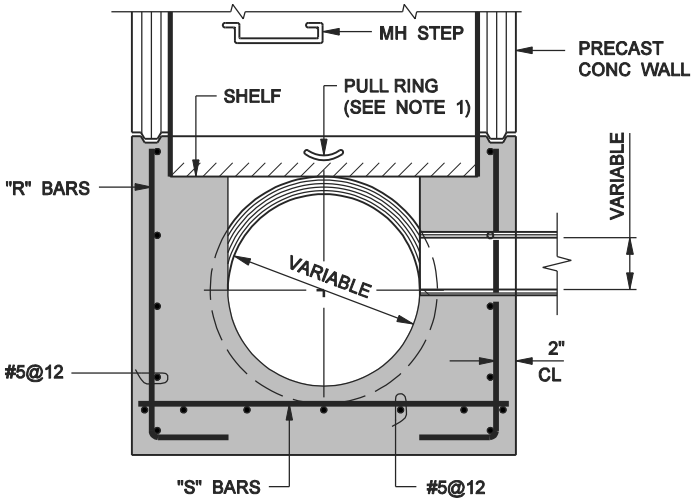
SECTION A-A



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
2009 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.

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 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 WRITTEN INSTRUCTIONS.

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

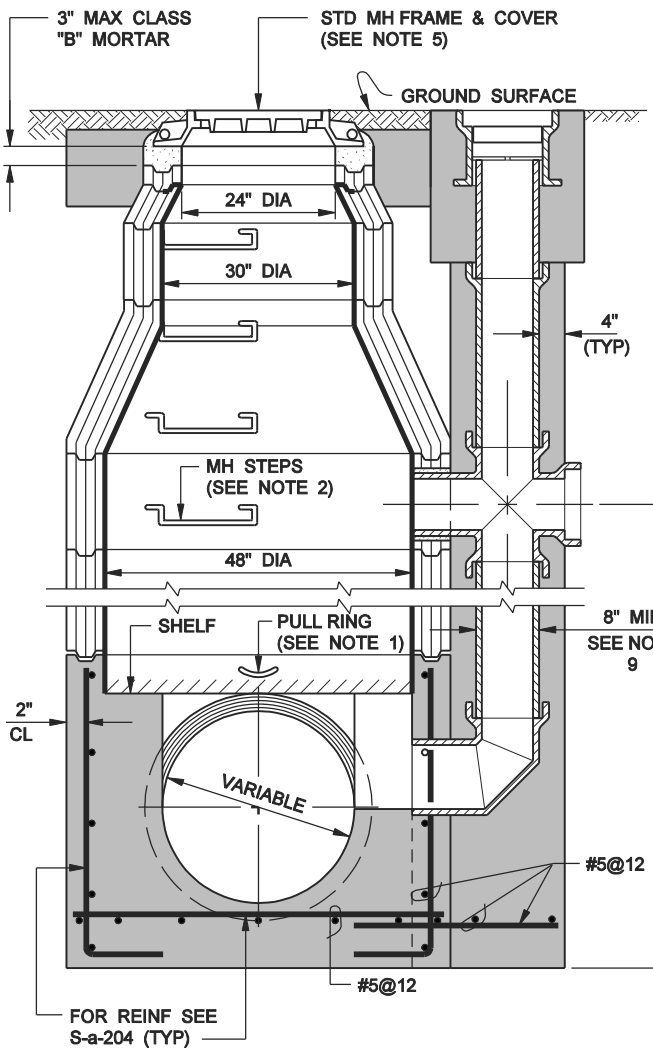
5. IN PAVED AREAS SUBJECT TO TRAFFIC, A 24" TRAFFIC MANHOLE FRAME AND COVER IN ACCORDANCE WITH S-a-228 SHALL BE PROVIDED. IN ALL OTHER AREAS, A 24" LOCKING MANHOLE FRAME AND COVER IN ACCORDANCE WITH S-a-207 SHALL BE PROVIDED. IF A 30" MANHOLE FRAME AND COVER IS REQUIRED, A FRAME AND COVER IN ACCORDANCE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

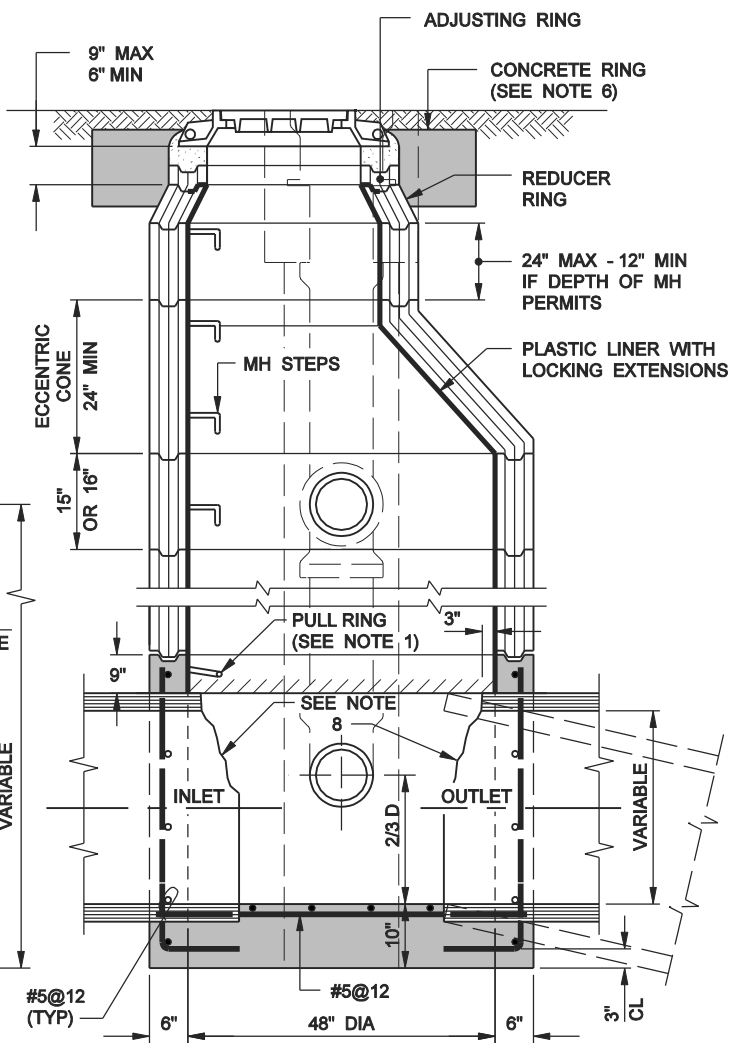
NOTES:

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.

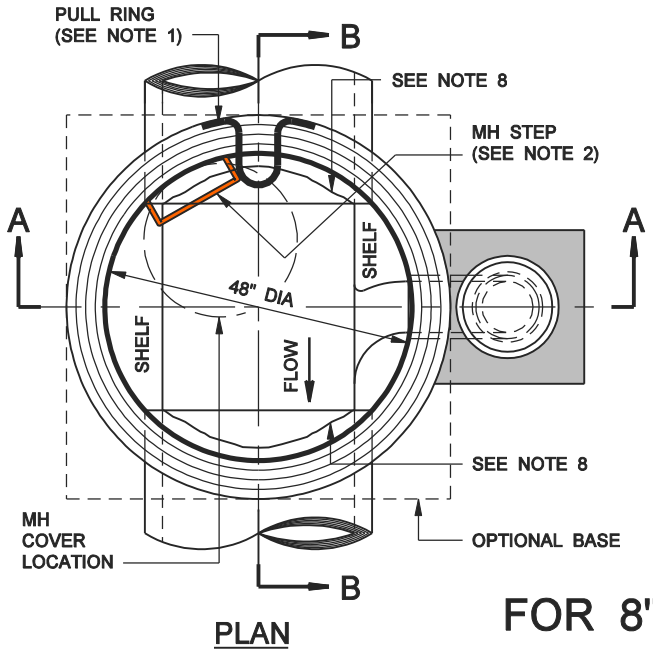
8. THE TOP PORTION OF THE PIPES WITHIN THE MANHOLE SHALL BE CUT OUT AS NECESSARY TO PROVIDE A CIRCULAR OPENING BETWEEN THE PIPE ENDS OF AT LEAST 42". THE CUT ENDS SHALL BE PLASTERED SMOOTH WITH CEMENT MORTAR FOR CONCRETE PIPE AND EPOXY FOR CLAY PIPE. THE CIRCULAR OPENING SHALL BE CUT PRIOR TO INSTALLATION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



SECTION A-A



SECTION B-B



PLAN

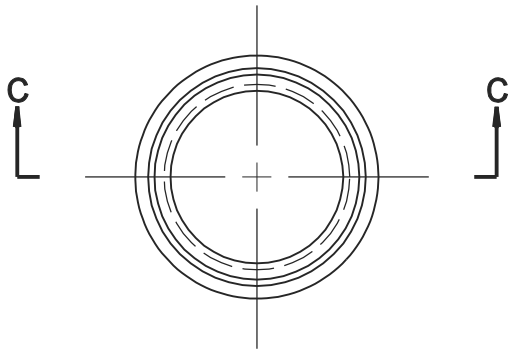
FOR 8" TO 30" PIPE

COUNTY SANITATION DISTRICTS OF LOS ANGELES COUNTY
OFFICE OF CHIEF ENGINEER

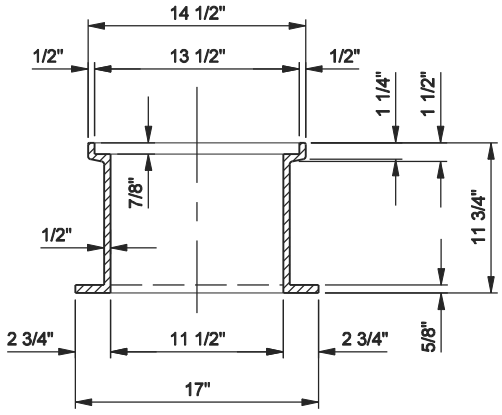
STEPHEN R. MAGUIN
CHIEF ENGINEER

STANDARD DROP MANHOLE

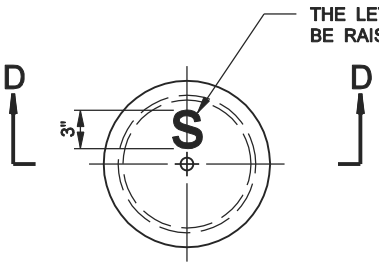
STANDARD DRAWING
2009 EDITION
S - a - 2 0 5
SHEET 1 OF 4



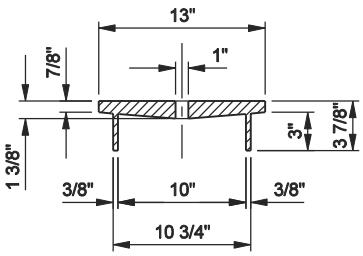
ACCESS FRAME



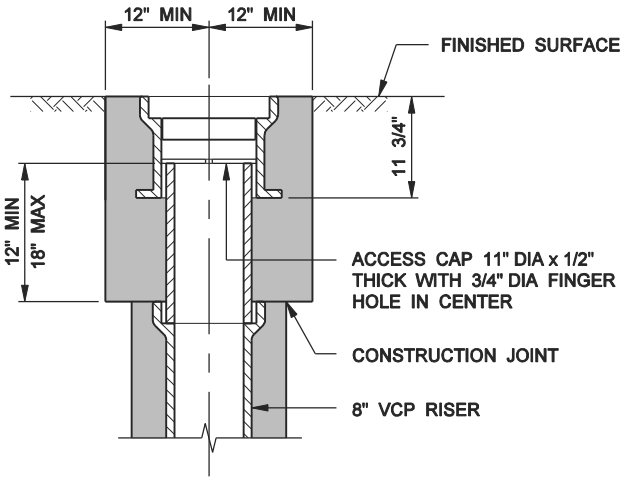
SECTION C-C



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
2009 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.

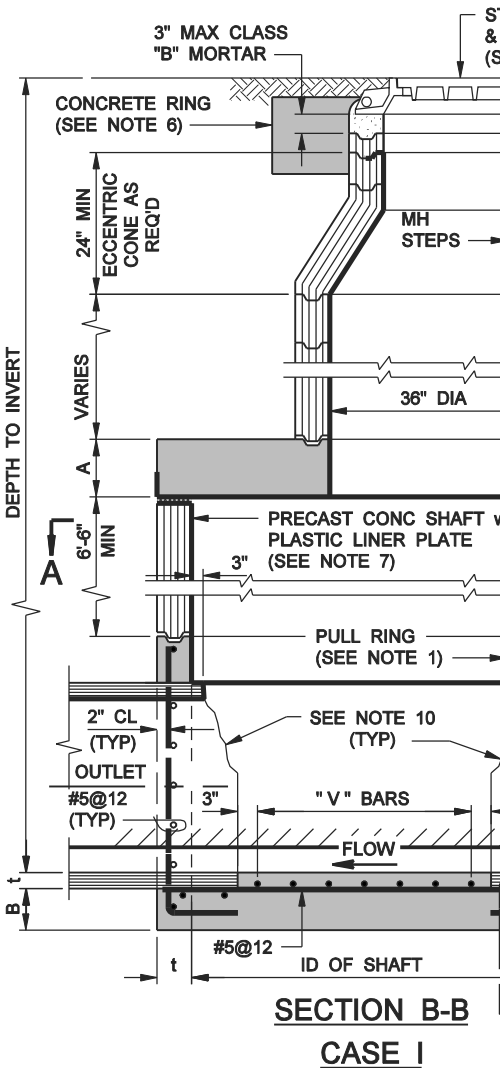
6. A 12" WIDE BY 12" HIGH CONCRETE RING SHALL BE PROVIDED AROUND THE MANHOLE FRAME. IN UNPAVED AREAS, THE CONCRETE RING SHALL BE PROVIDED WITH #3 REBAR, 30 DIAMETER LAP.

NOTES:

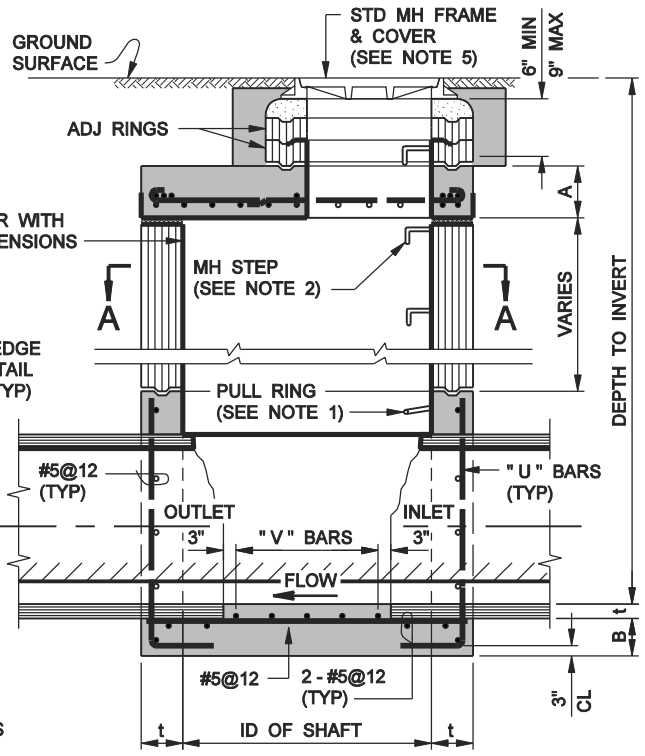
7. EXCEPT AS NOTED HEREON, THE PRECAST UNITS SHALL BE MANUFACTURED AND TESTED IN ACCORDANCE WITH ASTM C478. THE CURING OF THE PRECAST UNITS SHALL CONFORM TO SECTION 207-2.7 OF THE STANDARD SPECIFICATIONS. AS AN ALTERNATE, THE UNITS MAY BE CURED USING SATURATED STEAM FOR A MINIMUM OF 12 HOURS FOLLOWED 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.

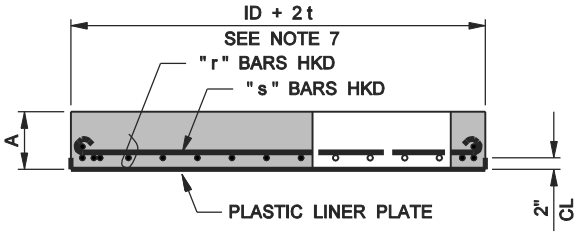
9. THE DROP CONNECTION INTO THE MANHOLE SHALL BE VCP AND SHALL BE THE SAME SIZE AS THE LATERAL SEWER OR A MINIMUM OF 8" IN DIAMETER, WHICHEVER IS LARGER. THE RISER SHALL BE 8" VCP.

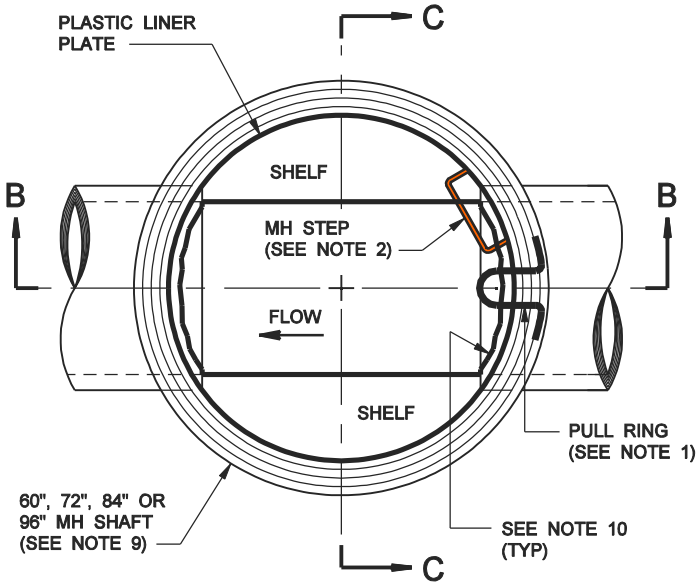


SECTION B-B
CASE I

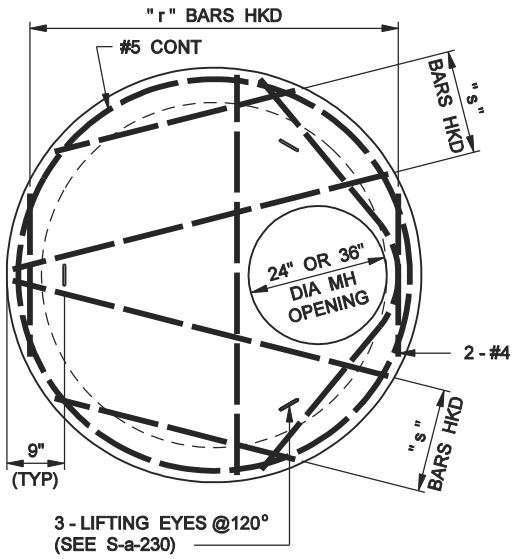


SECTION B-B
CASE II





PLAN - SECTION A-A



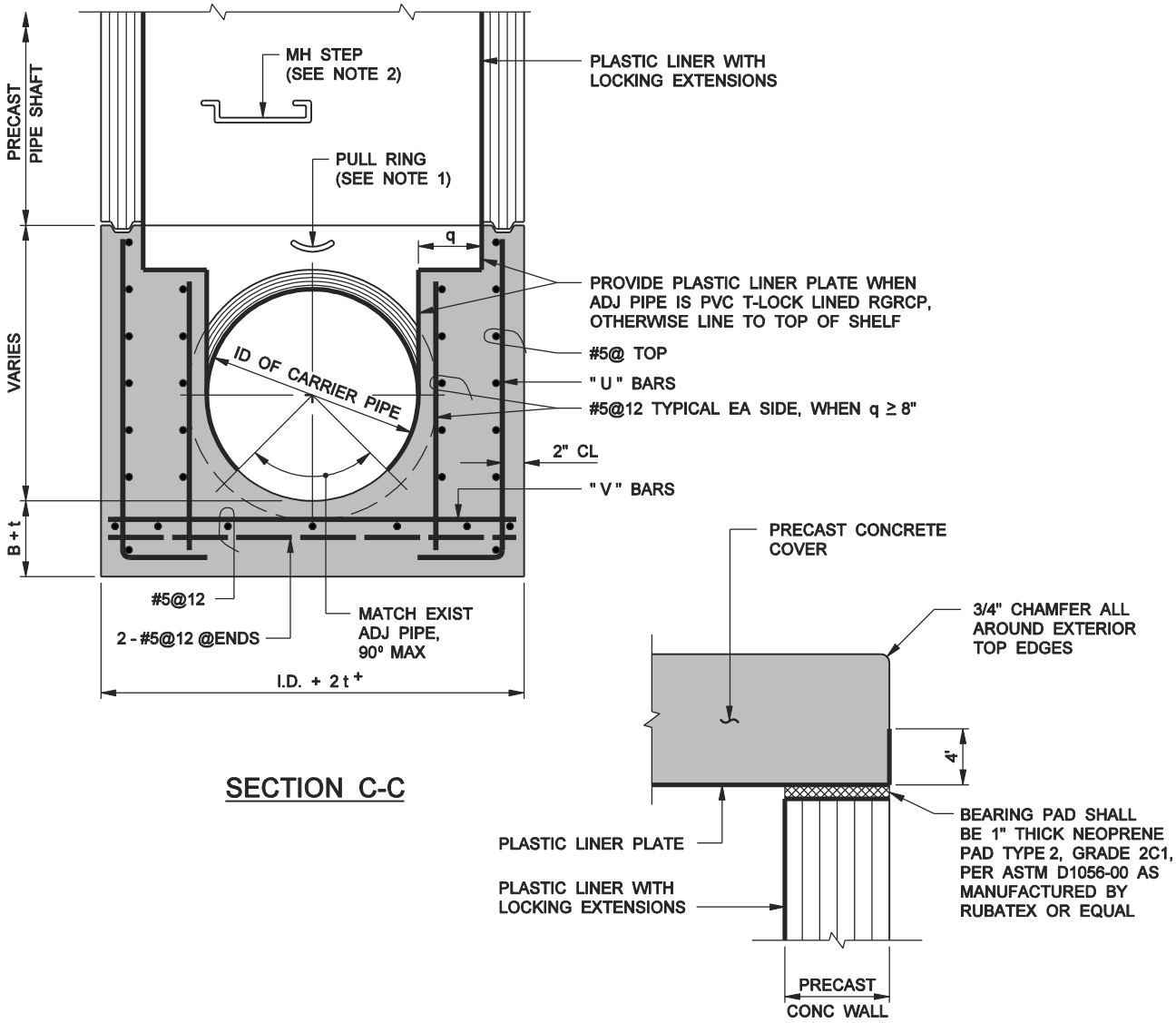
DETAIL OF FLAT SLAB TOP
24" OR 36" x 60", 72", 84" OR 96"

COUNTY SANITATION DISTRICTS OF LOS ANGELES COUNTY
OFFICE OF CHIEF ENGINEER

STEPHEN R. MAGUIN
CHIEF ENGINEER

STANDARD MANHOLE, TYPE "E"

STANDARD DRAWING
2009 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
2009 EDITION
S - a - 2 0 6
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 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 WRITTEN INSTRUCTIONS.

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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 DEPTH OF COVER LIMITATIONS INDICATED HEREON.

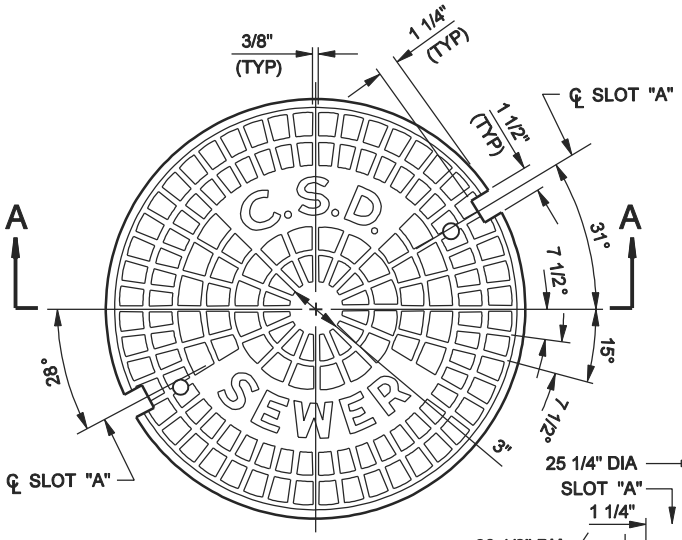
   CASE I SHALL NOT BE USED FOR COVER ON PIPE LESS THAN 12'.

   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).

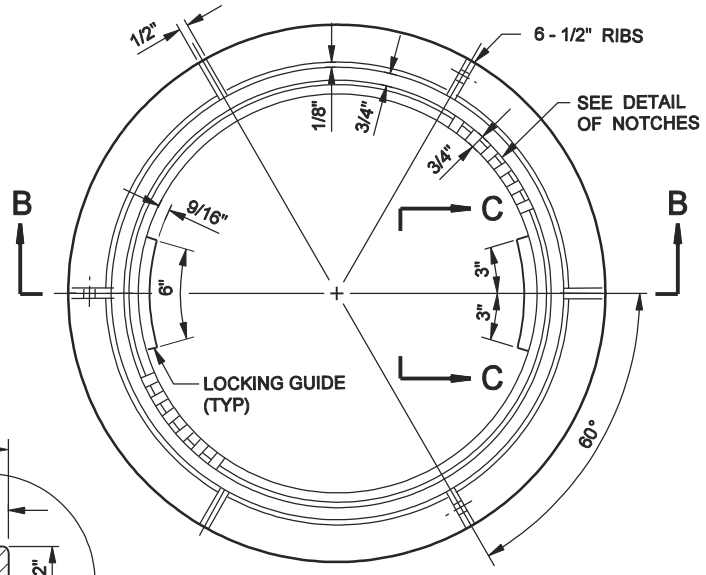
   60" I.D. - 5"; 72" I.D. - 6"; 84" I.D. - 7"; 96" I.D. - 8".

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.

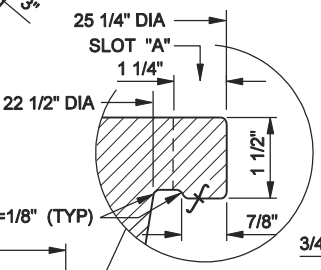


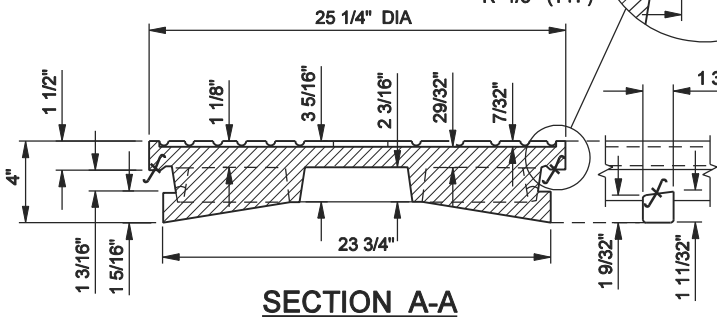
PLAN OF COVER

TOP VIEW

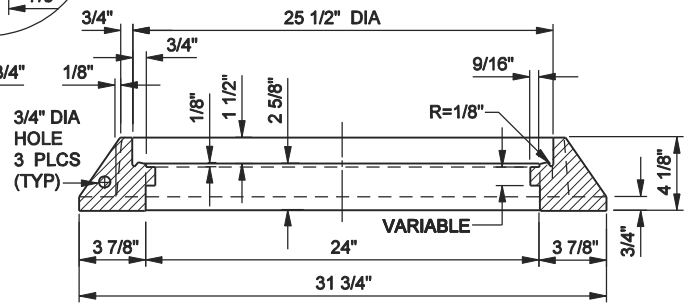


PLAN OF FRAME



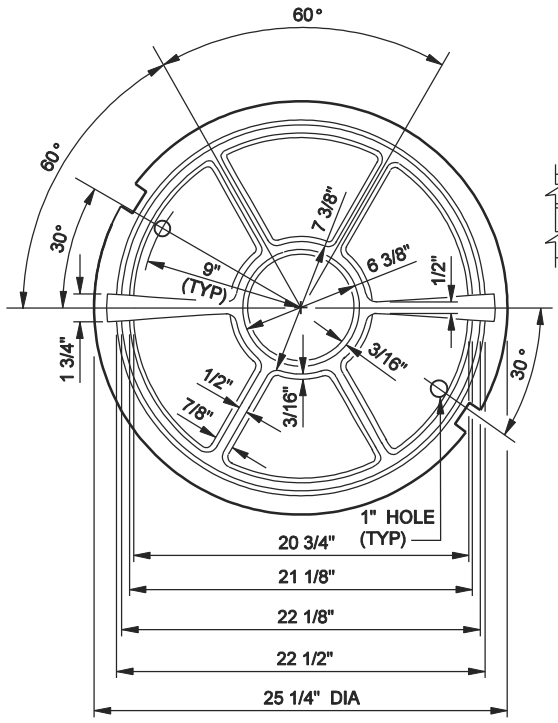


SECTION A-A



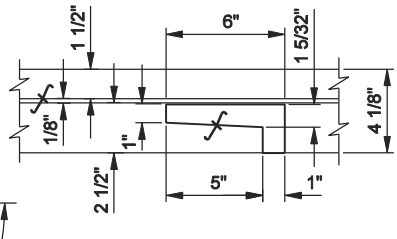
SECTION B-B

END VIEW COVER LUG

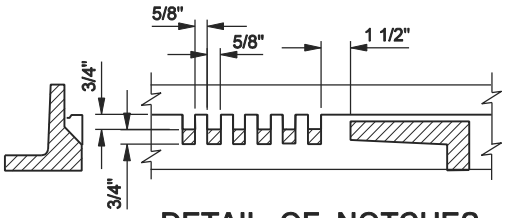


PLAN OF COVER

BOTTOM VIEW



SIDE VIEW C-C LOCKING GUIDE



DETAIL OF NOTCHES

NOTES:

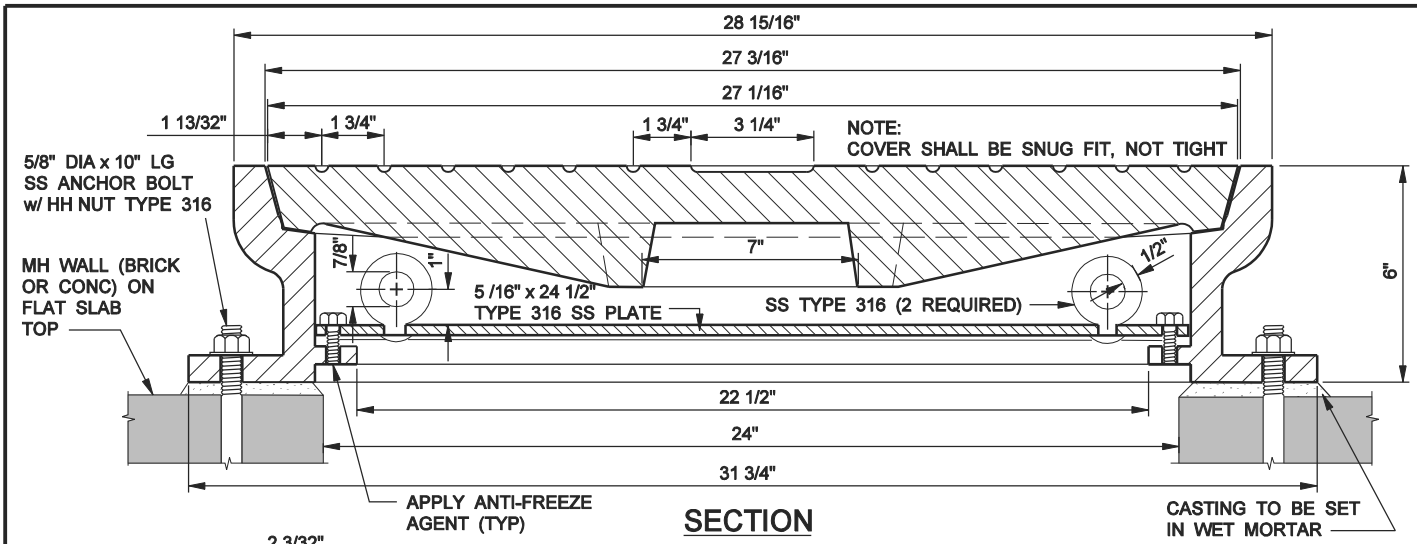
1. CAST IRON USED SHALL CONFORM TO ASTM A-48 CLASS 35B.
2. FRAME AND COVER SHALL BE COATED WITH ASPHALTUM OR BITUMINOUS PAINT AFTER TESTING AND INSPECTION.
3. FRAME AND COVER SHALL BE TESTED FOR ACCURATE FIT PRIOR TO DELIVERY AND SHALL BE MARKED IN SETS.
4. ALL CASTINGS SHALL COMPLY WITH SECTION 206-3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

COUNTY SANITATION DISTRICTS OF LOS ANGELES COUNTY
OFFICE OF CHIEF ENGINEER

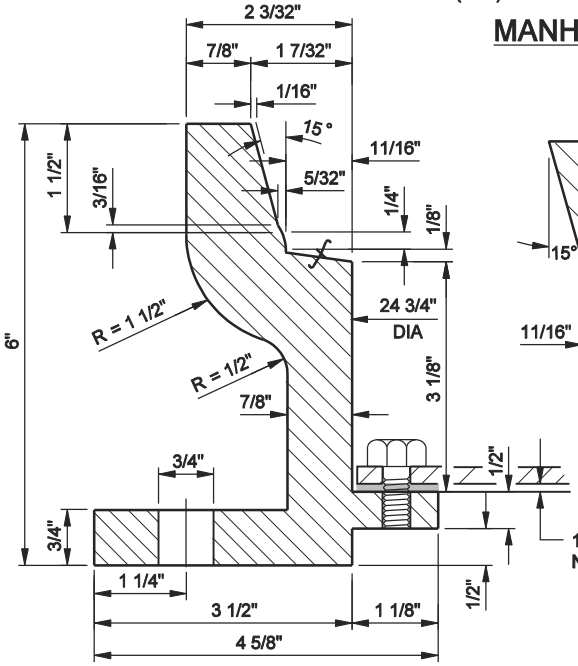
STEPHEN R. MAGUIN
CHIEF ENGINEER

STANDARD 24" LOCKING MANHOLE FRAME AND COVER

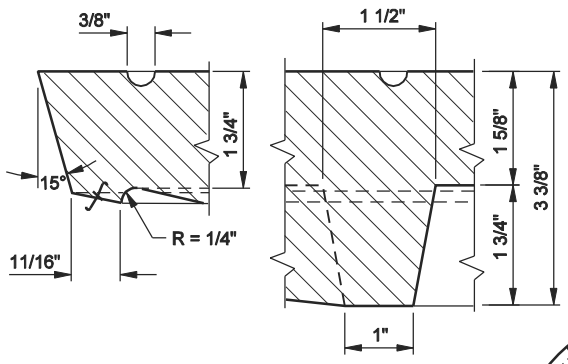
STANDARD DRAWING
2009 EDITION
S - a - 2 0 7
SHEET 1 OF 1



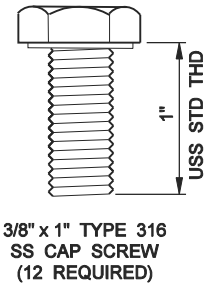
SECTION
MANHOLE FRAME AND COVER



SECTION A-A

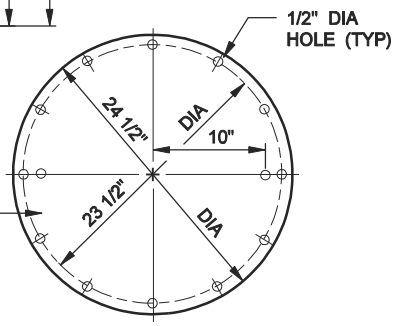


SECTION B-B



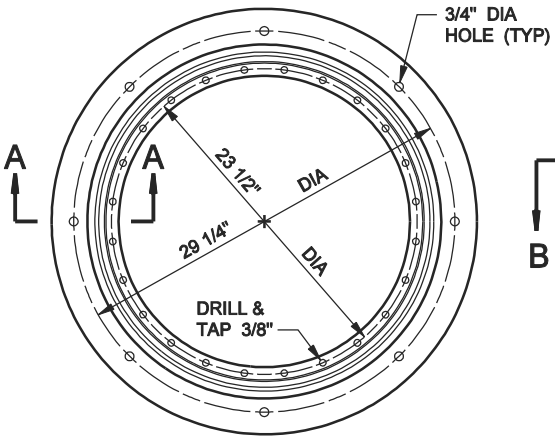
3/8" x 1" TYPE 316
SS CAP SCREW
(12 REQUIRED)

1 1/8" WIDE BY 1/8"
NEOPRENE GASKET

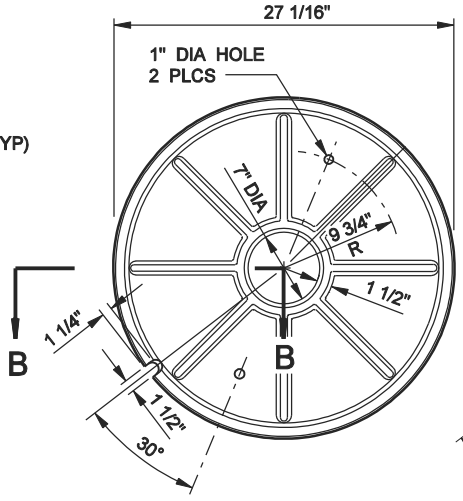


5/16" TYPE 316
SS PLATE

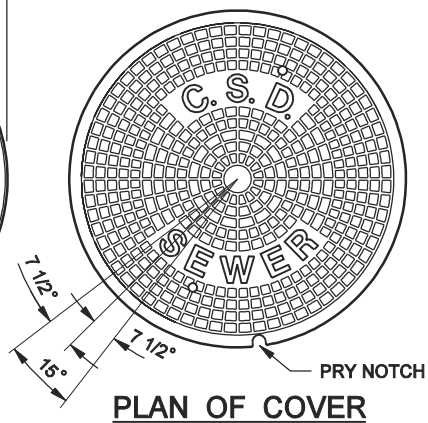
PRESSURE PLATE



PLAN OF FRAME



PLAN OF COVER
BOTTOM VIEW



PLAN OF COVER
TOP VIEW

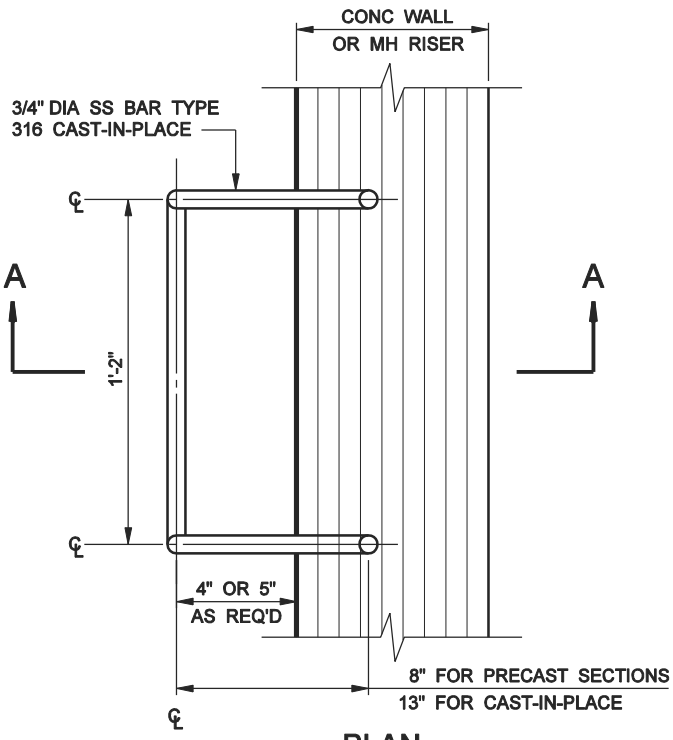
NOTE:
FOR NOTES SEE S-a-207.

COUNTY SANITATION DISTRICTS OF LOS ANGELES COUNTY
OFFICE OF CHIEF ENGINEER

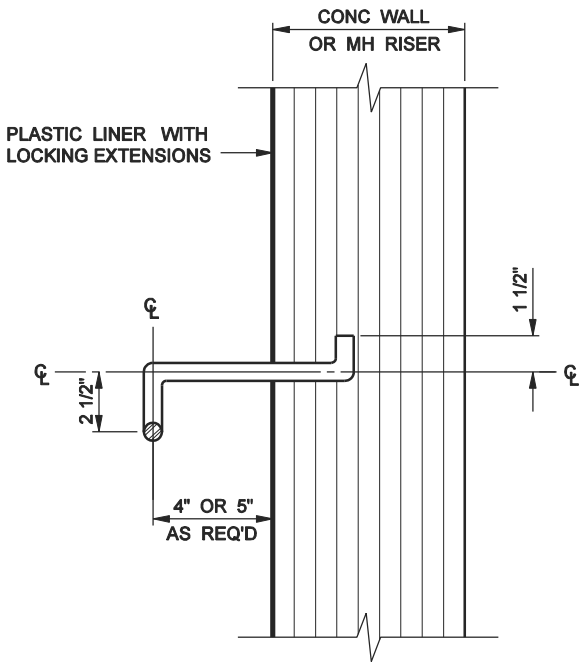
STEPHEN R. MAGUIN
CHIEF ENGINEER

STANDARD 24" PRESSURE MANHOLE FRAME AND COVER

STANDARD DRAWING
2009 EDITION
S - a - 2 0 8
SHEET 1 OF 1

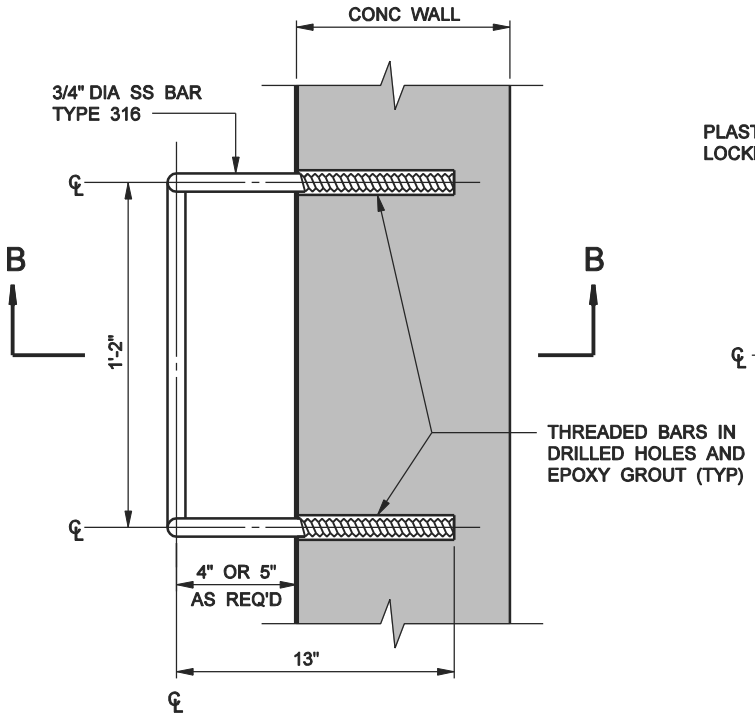


PLAN

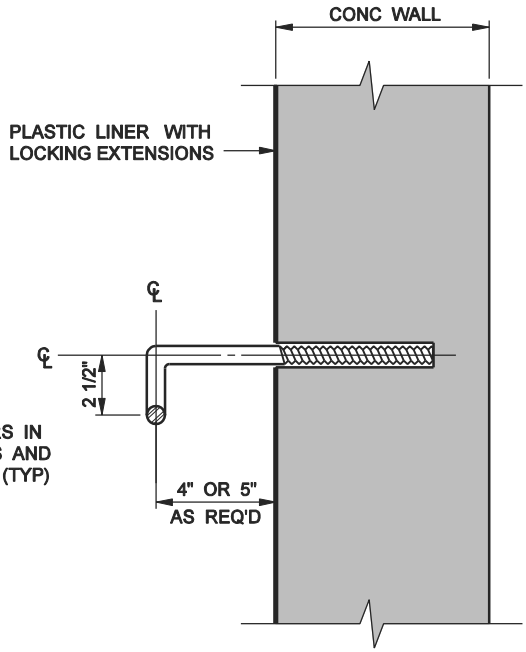


SECTION A-A

TYPE I MANHOLE STEP



PLAN



SECTION B-B

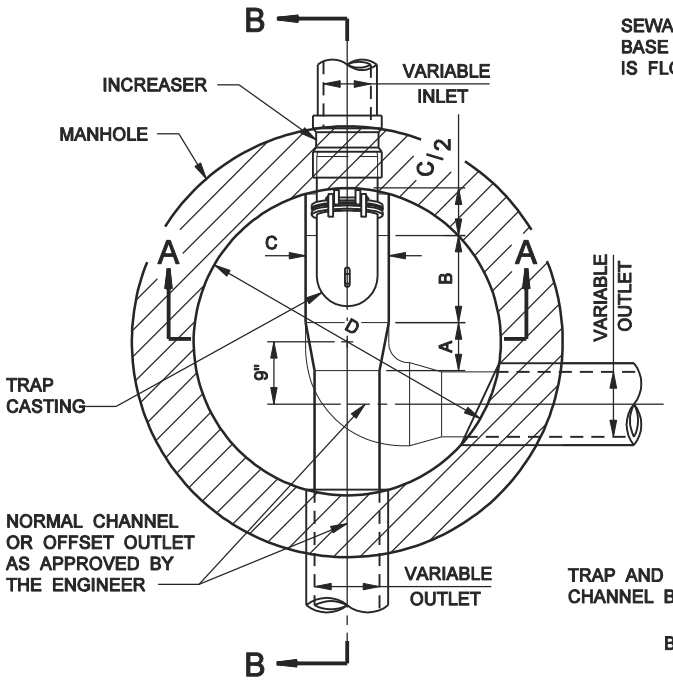
TYPE II MANHOLE STEP

COUNTY SANITATION DISTRICTS OF LOS ANGELES COUNTY
OFFICE OF CHIEF ENGINEER

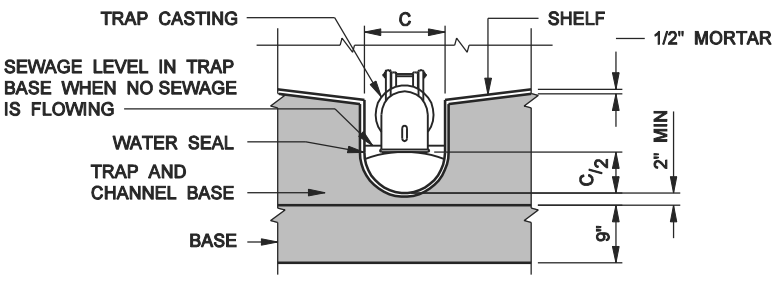
STEPHEN R. MAGUIN
CHIEF ENGINEER

STANDARD MANHOLE STEP

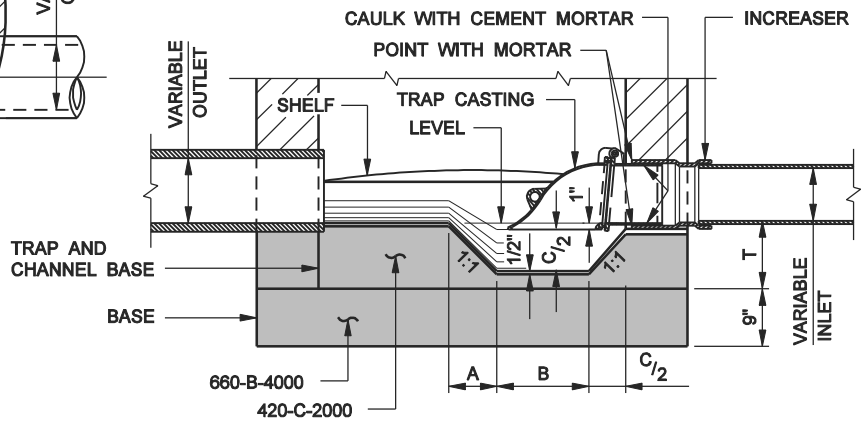
STANDARD DRAWING
2009 EDITION
S - a - 2 0 9
SHEET 1 OF 1



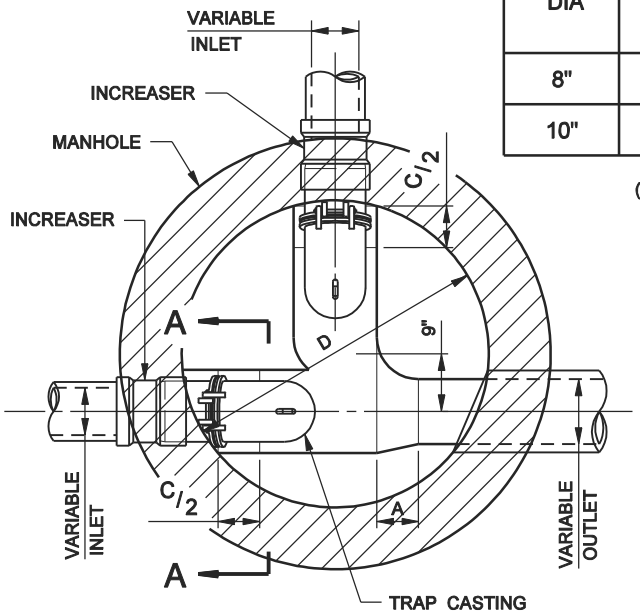
PLAN - SINGLE TRAP BASE



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 HAVE BRICKWORK, SEE S-a-201.

COUNTY SANITATION DISTRICTS OF LOS ANGELES COUNTY
OFFICE OF CHIEF ENGINEER

STEPHEN R. MAGUIN
CHIEF ENGINEER

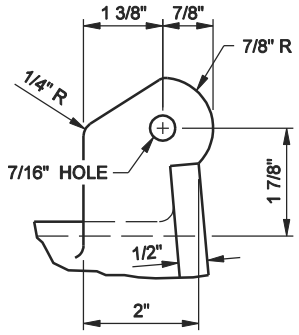
STANDARD TRAP MANHOLE BASE

STANDARD DRAWING
2009 EDITION
S - a - 2 1 0
SHEET 1 OF 1

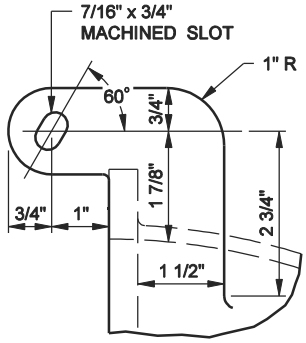
DIMENSIONS OF CASTINGS				
INLET DIA	A	B	R	L
10"	6"	9"	11"	14 3/4"
12"	7"	11"	13"	17 3/4"

NOTES:

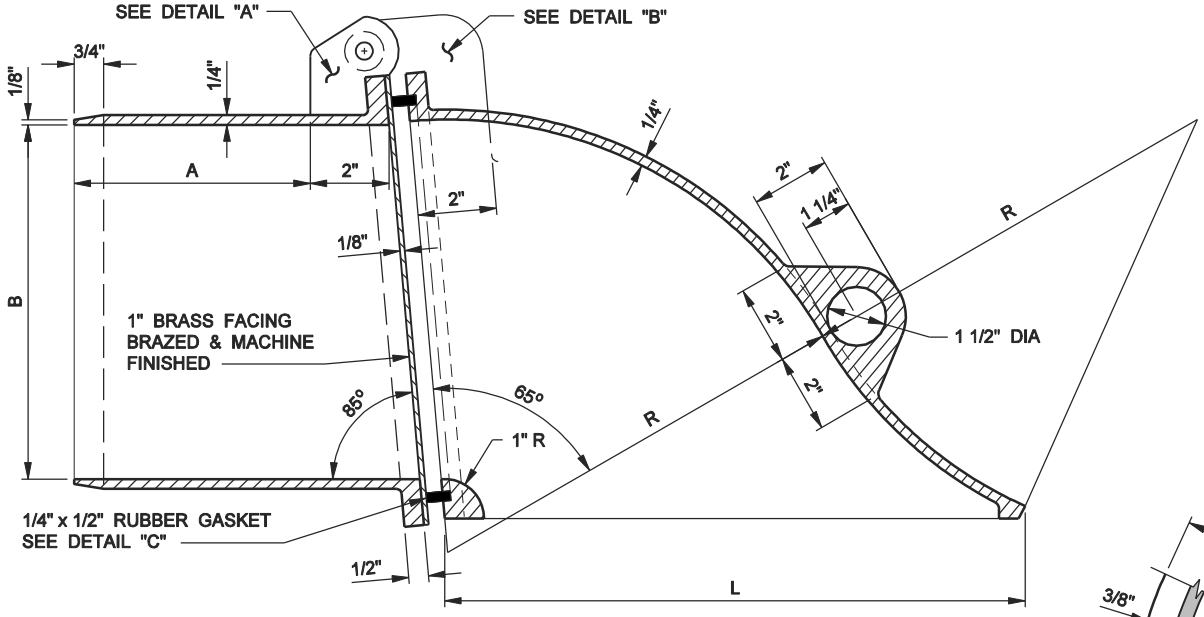
1. CAST IRON USED SHALL CONFORM WITH ASTM A-48 CLASS 35B.
2. FLANGES OF CASTING SHALL BE MACHINED FACED.
3. CASTINGS SHALL BE DIPPED TWICE IN HOT ASPHALT PAINT.
4. RUBBER GASKET SHALL BE NEOPRENE 35-50 SHORE.



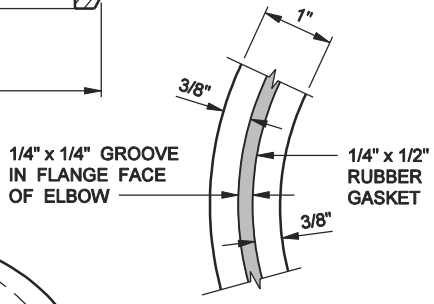
DETAIL "A"



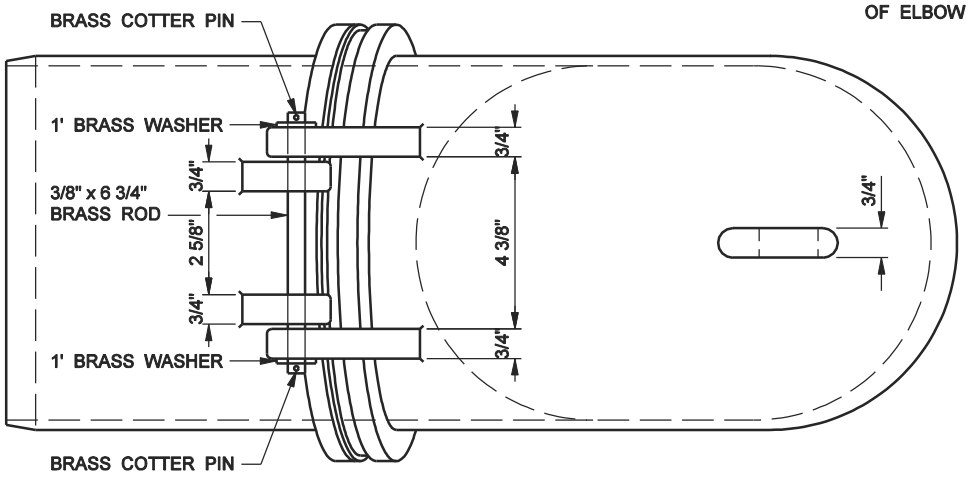
DETAIL "B"



SECTIONAL VIEW



DETAIL "C"



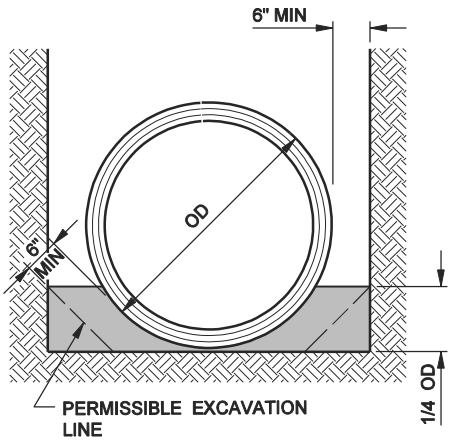
PLAN VIEW

COUNTY SANITATION DISTRICTS OF LOS ANGELES COUNTY
OFFICE OF CHIEF ENGINEER

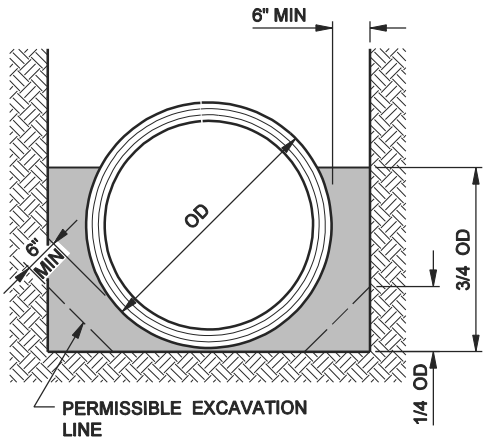
STEPHEN R. MAGUIN
CHIEF ENGINEER

STANDARD TRAP CASTING

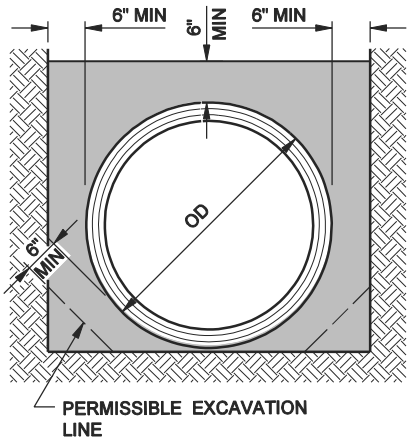
STANDARD DRAWING
2009 EDITION
S - a - 2 1 1
SHEET 1 OF 1



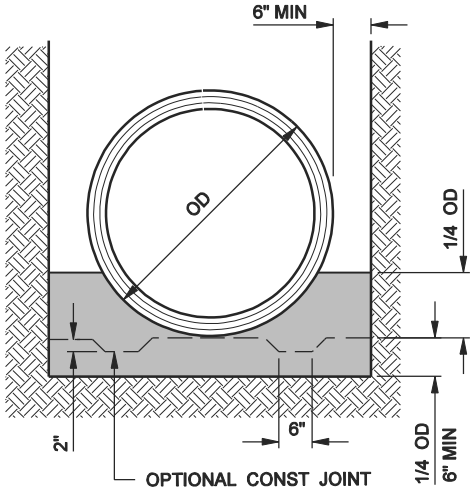
CRADLE TYPE 1



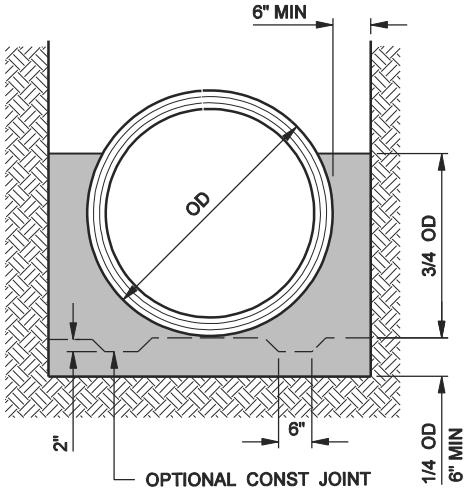
CRADLE TYPE 2



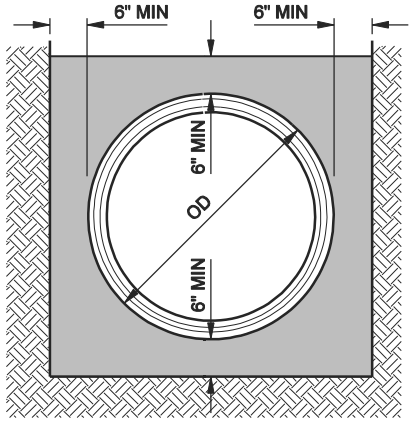
ENCASEMENT TYPE 1



CRADLE TYPE 1A



CRADLE TYPE 2A



ENCASEMENT TYPE 1A

NOTES:

1. ALL CONCRETE FOR CRADLES TYPE 1 AND 2 AND ENCASEMENT TYPE 1 SHALL BE 420-C-2000. ALL CONCRETE FOR CRADLES TYPE 1A AND 2A AND ENCASEMENT TYPE 1A SHALL BE 660-B-4000. USE IS LIMITED TO BEDDING CONCRETE OVER WHICH BACKFILL WILL BE PLACED NOT LESS THAN 40 HOURS AFTER PLACEMENT. FOR BACKFILL AFTER 24 HOURS, ADD A NON-CHLORIDE ACCELERATING ADMIXTURE APPROVED BY THE ENGINEER AT DOSEAGES AS REQUIRED BY THE MANUFACTURER OF THE ADMIXTURE. FOR BACKFILL AFTER 16 HOURS AND REMOVAL OF SHEETING AFTER 18 HOURS, USE 660-C-4000 WITH A NON-CHLORIDE ACCELERATING ADMIXTURE APPROVED BY THE ENGINEER AT DOSAGES AS REQUIRED BY THE MANUFACTURER OF THE ADMIXTURE.

2. THE CONCRETE FOR CRADLES TYPE 1 AND 2 AND ENCASEMENT TYPE 1 SHALL NOT BE POURED AGAINST TRENCH SHEETING, FORMS, OR ON LOOSE MATERIAL IN THE TRENCH BOTTOM, BUT SHALL BE POURED AGAINST AND ON THE UNDISTURBED TRENCH WALLS AND BOTTOM.

3. THE CONCRETE FOR CRADLES TYPE 1A AND 2A AND ENCASEMENT TYPE 1A MAY BE POURED AGAINST TRENCH SHEETING, FORMS, OR AGAINST THE TRENCH WALLS, BUT SHALL NOT BE POURED ON LOOSE MATERIAL IN THE TRENCH BOTTOM.

4. UNLESS OTHERWISE PROVIDED IN THE SPECIFICATIONS OR AUTHORIZED BY THE ENGINEER, WHEN THE MAXIMUM ALLOWABLE TRENCH WIDTH HAS BEEN EXCEEDED. THE PIPE SHALL BE CRADLED WITH TYPE 1 OR TYPE 2 IF THE TRENCH IS IN UNDISTURBED SOIL OR TYPE 1A OR TYPE 2A IF THE TRENCH IS IN UNSTABLE SOIL. IF THE TRENCH WIDTH IS LESS THAN ONE AND ONE HALF TIMES THE MAXIMUM ALLOWED BY THE SPECIFICATIONS WITHOUT SPECIAL BEDDING, OR IF THE COVER ON THE PIPE IS LESS THAN TEN FEET. CRADLE TYPE 1 OR 1A SHALL BE USED. IF THE TRENCH WIDTH IS MORE THAN ONE AND ONE HALF TIMES THE MAXIMUM ALLOWED BY THE SPECIFICATIONS WITHOUT SPECIAL BEDDING AND THE COVER IS TEN FEET OR MORE, CRADLE TYPE 2 OR 2A SHALL BE USED.

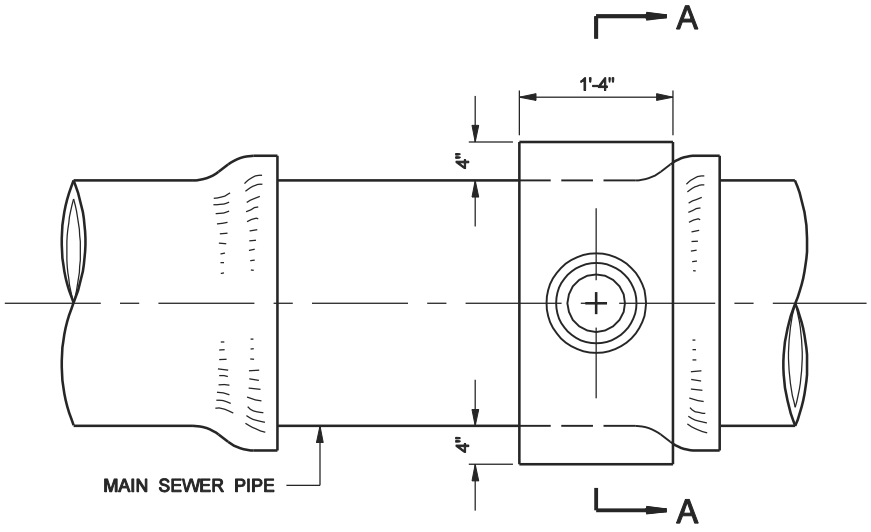
5. UNLESS OTHERWISE AUTHORIZED BY THE ENGINEER, ALL CRADLES AND ENCASEMENTS SHALL BE PLACED SUCH THAT BOTH ENDS TERMINATE WITHIN 18 INCHES OF A FLEXIBLE JOINT.

COUNTY SANITATION DISTRICTS OF LOS ANGELES COUNTY
OFFICE OF CHIEF ENGINEER

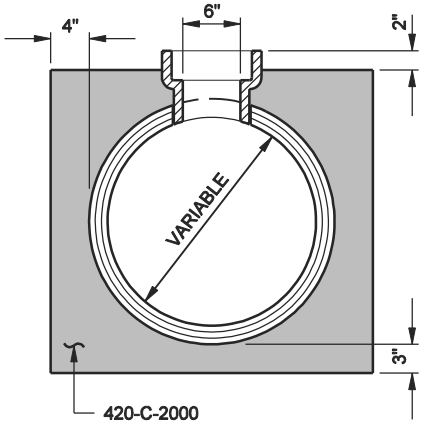
STEPHEN R. MAGUIN
CHIEF ENGINEER

STANDARD CONCRETE CRADLES AND ENCASEMENTS

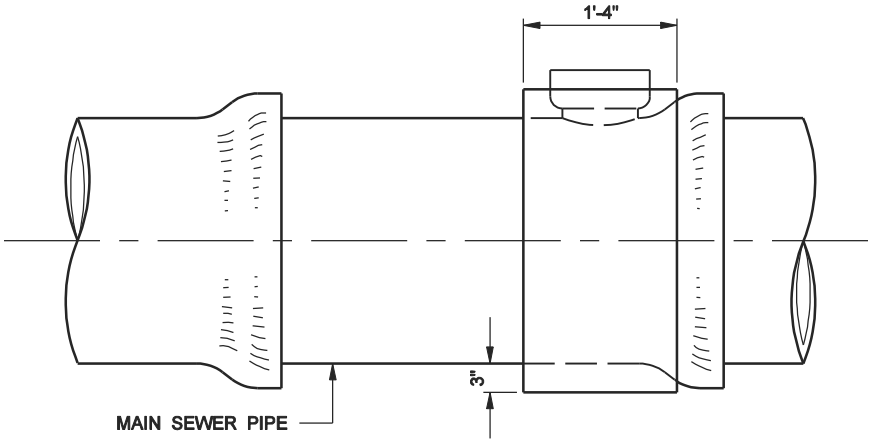
STANDARD DRAWING
2006 EDITION
S - a - 2 1 2
SHEET 1 OF 1



PLAN



SECTION A-A



ELEVATION

COUNTY SANITATION DISTRICTS OF LOS ANGELES COUNTY
OFFICE OF CHIEF ENGINEER

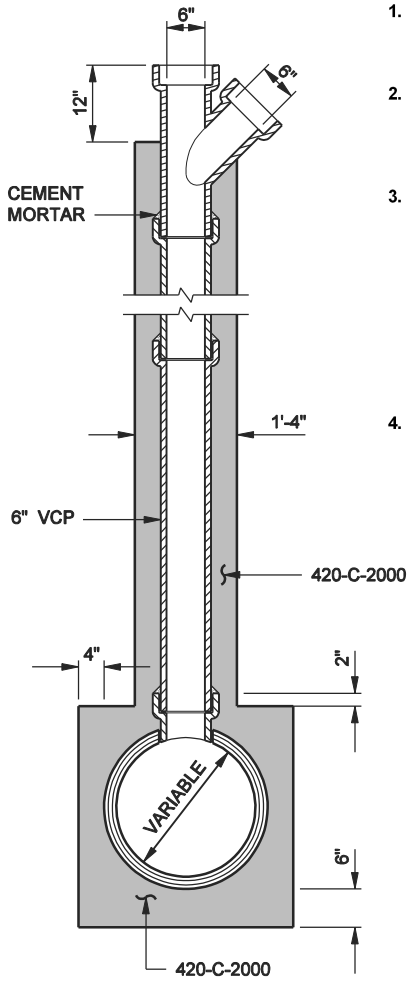
STEPHEN R. MAGUIN
CHIEF ENGINEER

STANDARD "T" FOUNDATION

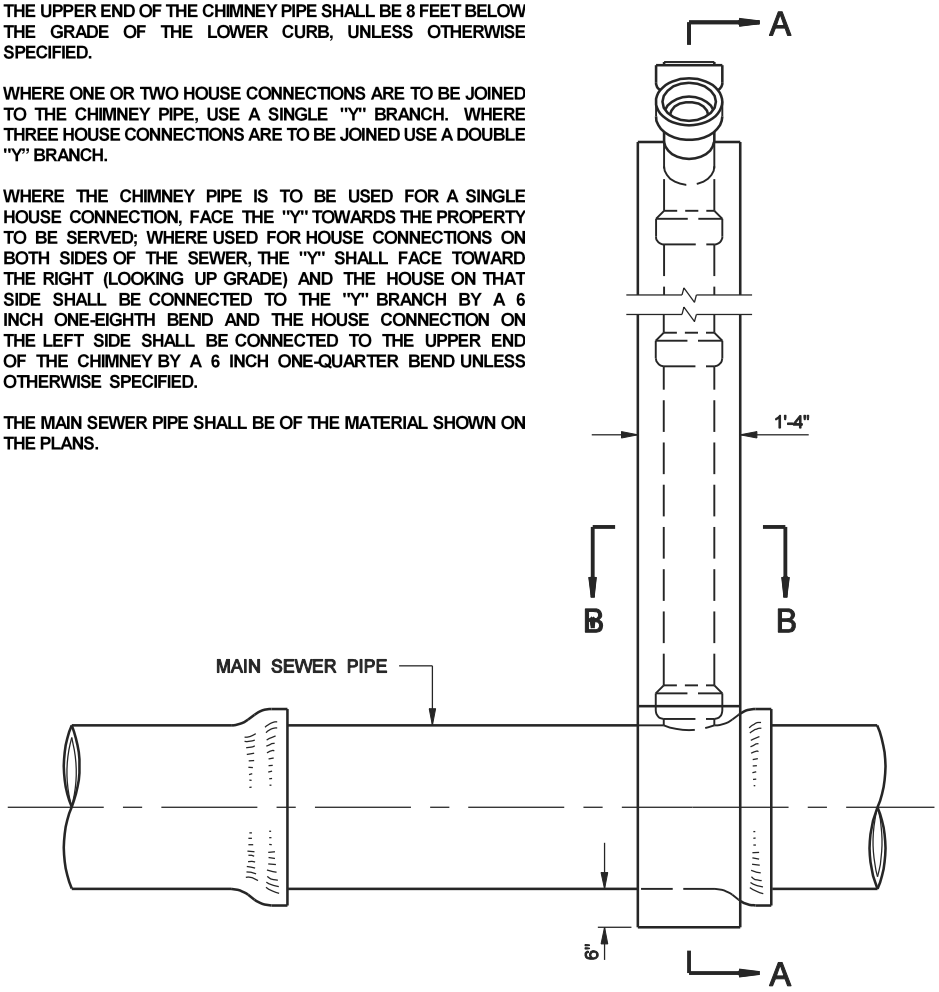
STANDARD DRAWING
2009 EDITION
S - a - 2 1 3
SHEET 1 OF 1

NOTES:

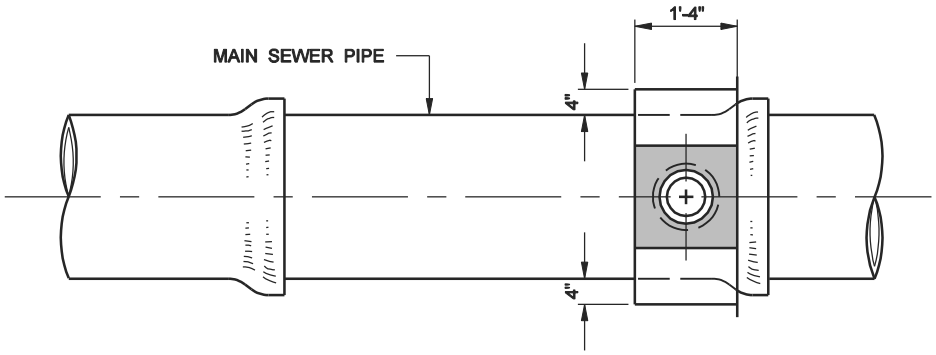
1. THE UPPER END OF THE CHIMNEY PIPE SHALL BE 8 FEET BELOW THE GRADE OF THE LOWER CURB, UNLESS OTHERWISE SPECIFIED.
2. WHERE ONE OR TWO HOUSE CONNECTIONS ARE TO BE JOINED TO THE CHIMNEY PIPE, USE A SINGLE "Y" BRANCH. WHERE THREE HOUSE CONNECTIONS ARE TO BE JOINED USE A DOUBLE "Y" BRANCH.
3. WHERE THE CHIMNEY PIPE IS TO BE USED FOR A SINGLE HOUSE CONNECTION, FACE THE "Y" TOWARDS THE PROPERTY TO BE SERVED; WHERE USED FOR HOUSE CONNECTIONS ON BOTH SIDES OF THE SEWER, THE "Y" SHALL FACE TOWARD THE RIGHT (LOOKING UP GRADE) AND THE HOUSE ON THAT SIDE SHALL BE CONNECTED TO THE "Y" BRANCH BY A 6 INCH ONE-EIGHTH BEND AND THE HOUSE CONNECTION ON THE LEFT SIDE SHALL BE CONNECTED TO THE UPPER END OF THE CHIMNEY BY A 6 INCH ONE-QUARTER BEND UNLESS OTHERWISE SPECIFIED.
4. THE MAIN SEWER PIPE SHALL BE OF THE MATERIAL SHOWN ON THE PLANS.



SECTION A-A



ELEVATION



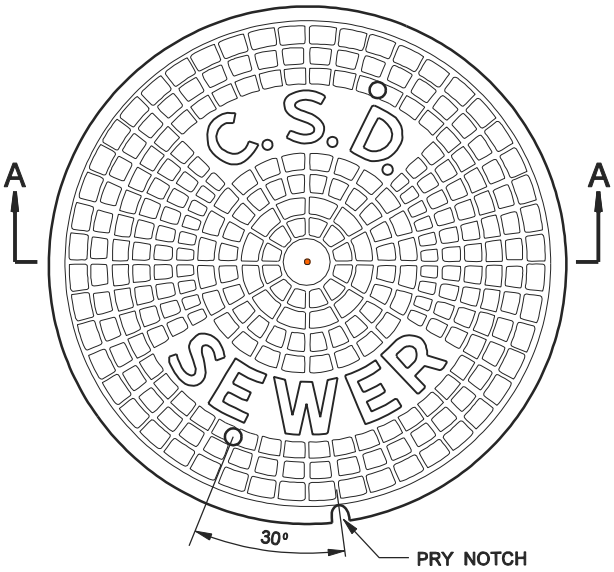
PLAN-SECTION B-B

COUNTY SANITATION DISTRICTS OF LOS ANGELES COUNTY
OFFICE OF CHIEF ENGINEER

STEPHEN R. MAGUIN
CHIEF ENGINEER

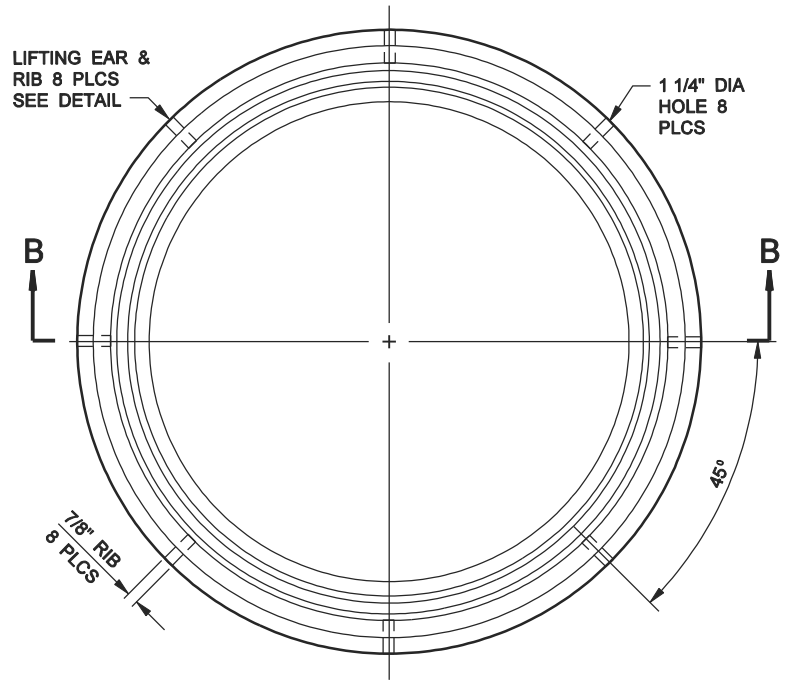
STANDARD CHIMNEY PIPE

STANDARD DRAWING
2009 EDITION
S - a - 2 1 4
SHEET 1 OF 1

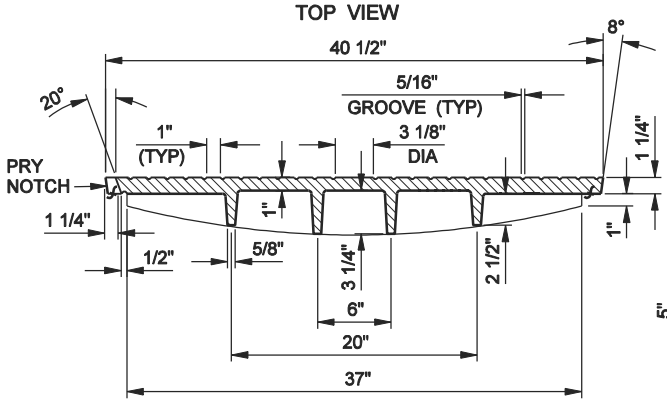


PLAN OF COVER

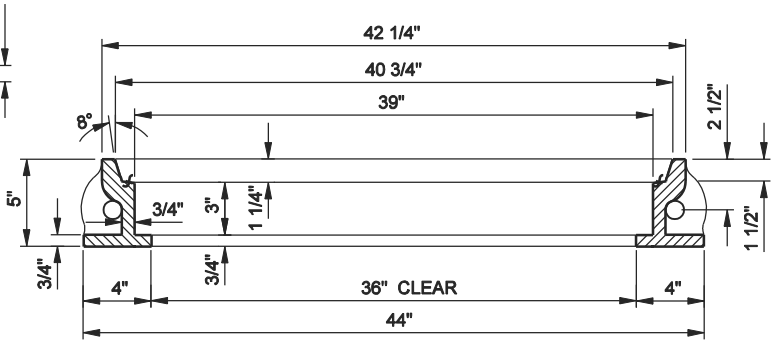
TOP VIEW



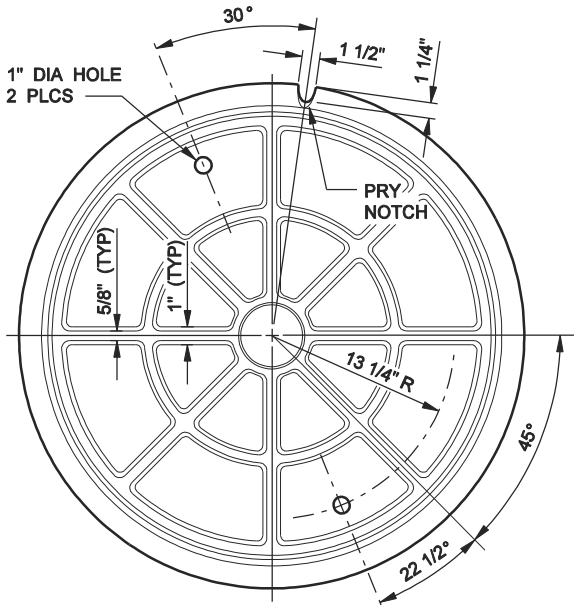
PLAN OF FRAME



SECTION A-A

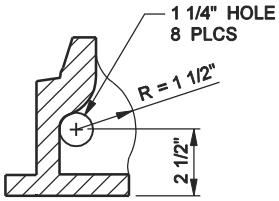


SECTION B-B



PLAN OF COVER

BOTTOM VIEW



DETAIL

LIFTING EAR & RIB

NOTES:

1. CAST IRON USED SHALL CONFORM TO 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

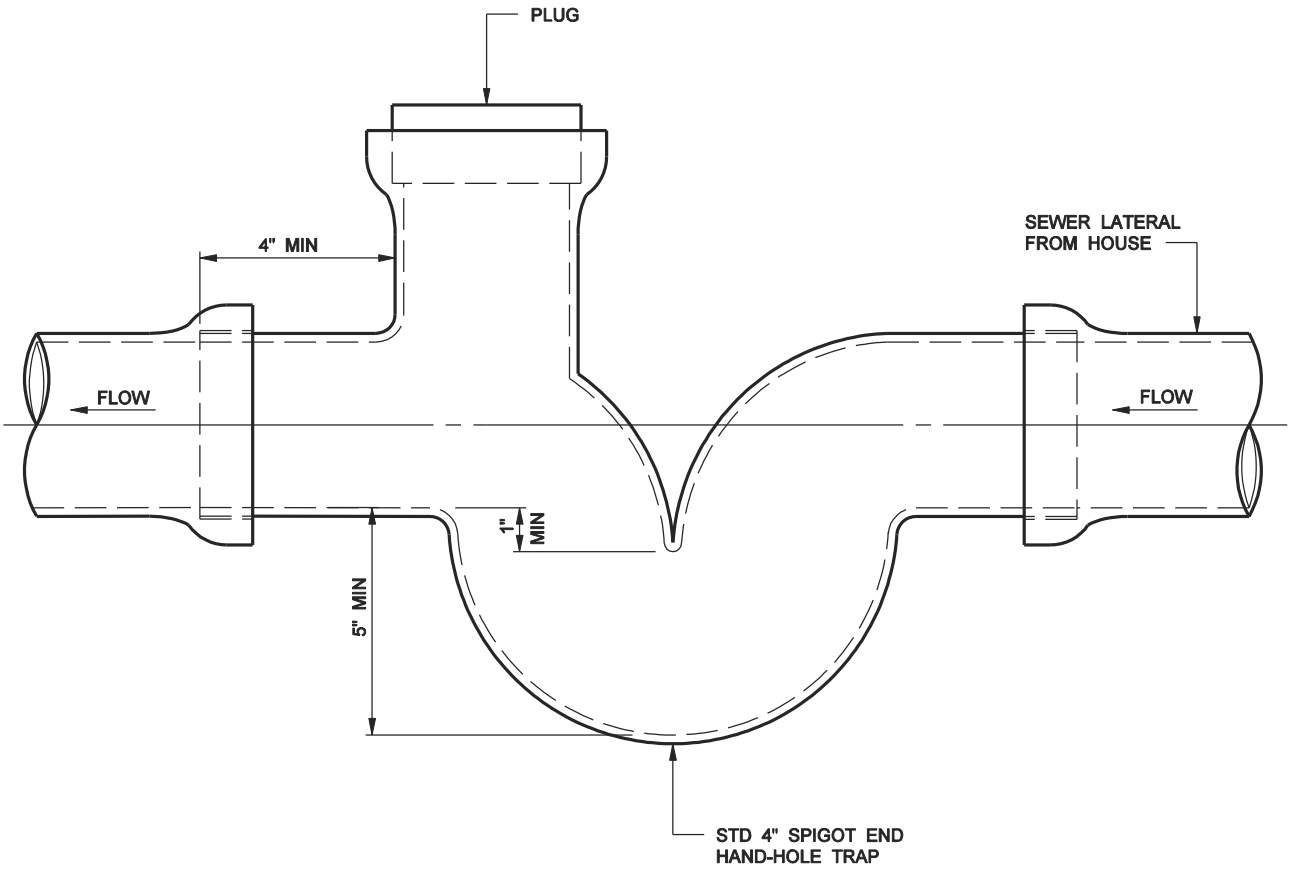
STEPHEN R. MAGUIN
CHIEF ENGINEER

STANDARD 36" MANHOLE FRAME AND COVER

STANDARD DRAWING
2009 EDITION

S - a - 2 1 5

SHEET 1 OF 1



NOTES:

1. GAS TRAP SHALL BE INSERTED AT THE POINT OR POINTS OF CONNECTION TO THE HOUSE PLUMBING TWO (2) FEET OUTSIDE THE BUILDING AT PROPERTY OWNER'S EXPENSE.

2. SPIGOT END HAND-HOLE TRAPS OF CAST IRON SOIL PIPE MAY BE USED IN LIEU OF VITRIFIED CLAY PIPE FITTINGS.

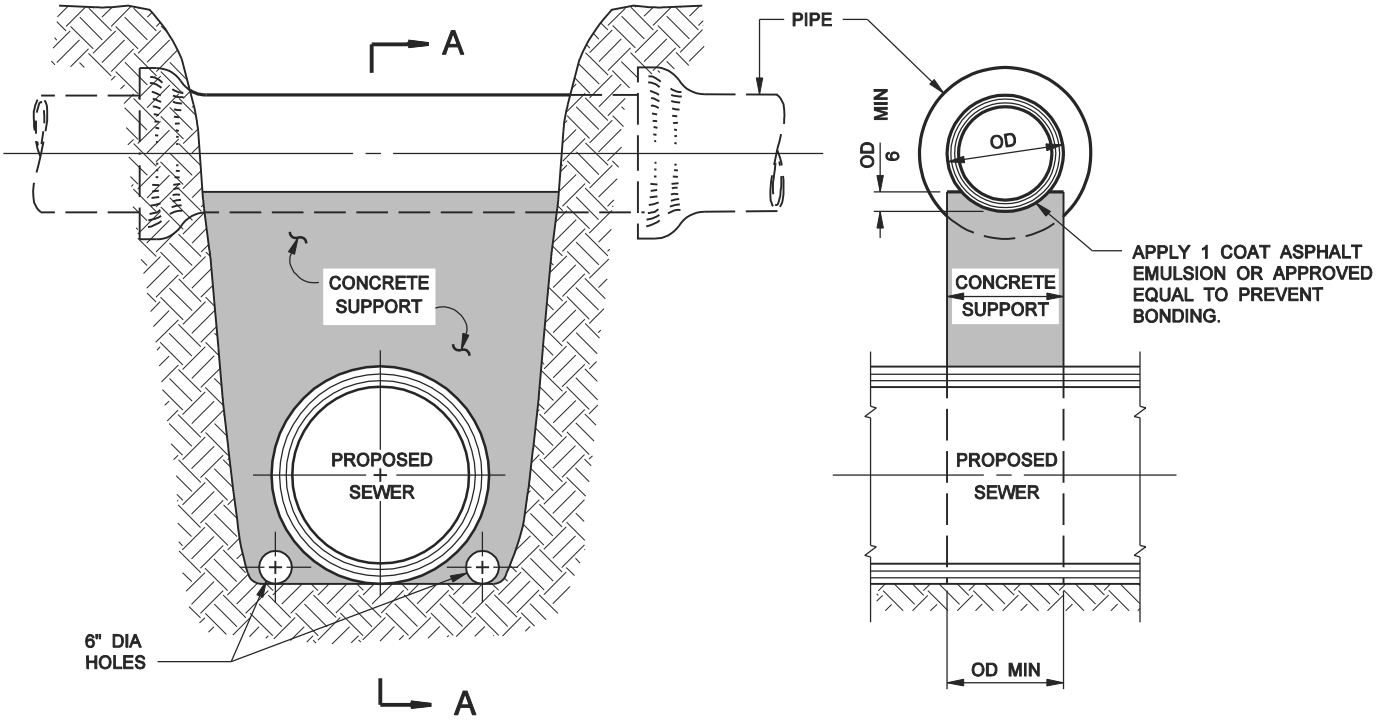
3. GAS TRAP MADE OF OTHER MATERIALS MAY BE SUBMITTED FOR APPROVAL.

COUNTY SANITATION DISTRICTS OF LOS ANGELES COUNTY
OFFICE OF CHIEF ENGINEER

STEPHEN R. MAGUIN
CHIEF ENGINEER

STANDARD HOUSE CONNECTION GAS TRAP

STANDARD DRAWING
2009 EDITION
S - a - 2 1 6
SHEET 1 OF 1



ELEVATION

SECTION A-A

NOTES:

1. CONCRETE SUPPORT SHALL BE POURED AGAINST UNDISTURBED SOIL ON THE BOTTOM AND SHALL EXTEND THE FULL WIDTH OF EXCAVATION.

2. CONCRETE SHALL BE 420–C–2000. WHEN APPROVED BY THE ENGINEER, THE CONTRACTOR MAY SUBSTITUTE CONCRETE WITH 2-SACK CEMENT SAND SLURRY.

3. CONTRACTOR SHALL OBTAIN APPROVAL FROM THE ENGINEER OF HIS PROPOSED METHOD OF SUPPORTING THE EXISTING PIPE LINES DURING CONSTRUCTION.

4. CONTRACTOR SHALL PROVIDE CONCRETE PIPE SUPPORT UNDER ALL EXISTING CONCRETE, ASBESTOS CEMENT, CLAY, TELEPHONE AND POWER CONDUITS AND UNDER ALL OTHER CONDUITS WHERE REQUIRED ON THE PLANS OR REQUESTED BY OWNER.

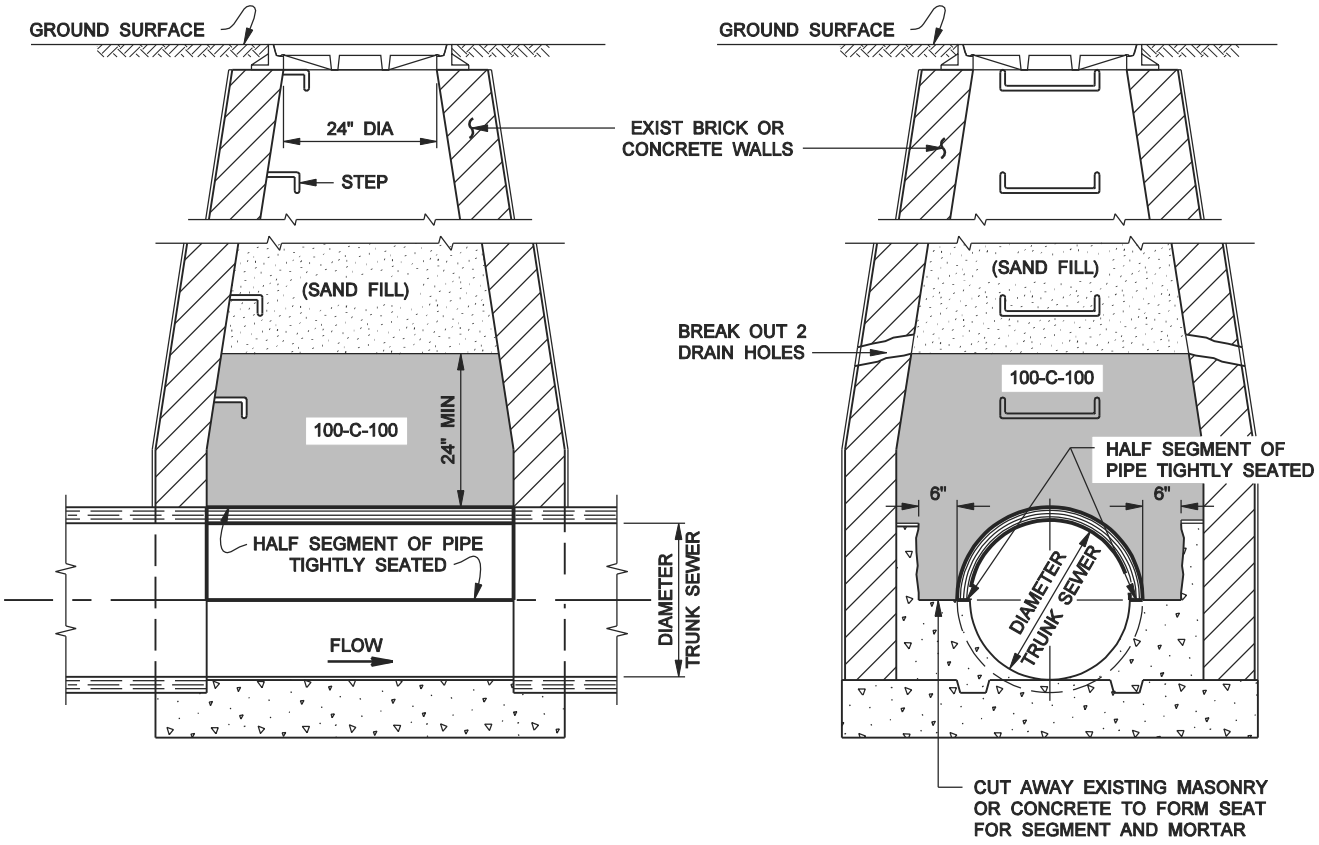
5. CONCRETE PIPE SUPPORT TO BE PAID UNDER THE APPROPRIATE PIPE BID ITEM.

COUNTY SANITATION DISTRICTS OF LOS ANGELES COUNTY
OFFICE OF CHIEF ENGINEER

STEPHEN R. MAGUIN
CHIEF ENGINEER

STANDARD CONCRETE PIPE SUPPORT

STANDARD DRAWING
2009 EDITION
S - a - 2 1 7
SHEET 1 OF 1



LONGITUDINAL SECTION

CROSS SECTION

NOTES:

1. FORTY-EIGHT HOURS PRIOR TO COMMENCING THE ABANDONMENT OF THE MANHOLE. THE CONTRACTOR SHALL CONTACT THE DISTRICTS' SUPERINTENDENT OF MAINTENANCE AT (323) 774-7272.
2. NO WORK SHALL BE DONE ON MANHOLE EXCEPT IN THE PRESENCE OF COUNTY SANITATION DISTRICT REPRESENTATIVE.
3. MANHOLE FRAME AND COVER OF THE MANHOLE TO BE ABANDONED SHALL BE SALVAGED, CLEANED AND DELIVERED TO THE DISTRICTS' COMPTON FIELD OFFICE, 920 SOUTH ALAMEDA STREET, COMPTON, CALIFORNIA.
4. THE CONTRACTOR SHALL REMOVE A MINIMUM OF THREE FEET OF THE MANHOLE SHAFT BELOW STREET SUBGRADE.
5. IF THE LOWER PORTION OF THE EXISTING CHANNEL THROUGH THE MANHOLE IS NOT AS SHOWN. THE CHANNEL SHALL BE REFORMED AS DIRECTED BY THE COUNTY SANITATION DISTRICT REPRESENTATIVE.
6. HALF SEGMENT OF PIPE SHALL BE OF THE TYPE USED IN THE SEWER.

COUNTY SANITATION DISTRICTS OF LOS ANGELES COUNTY
OFFICE OF CHIEF ENGINEER

STEPHEN R. MAGUIN
CHIEF ENGINEER

STANDARD ABANDONMENT OF EXISTING MANHOLES TYPE "A" OR "D"

STANDARD DRAWING
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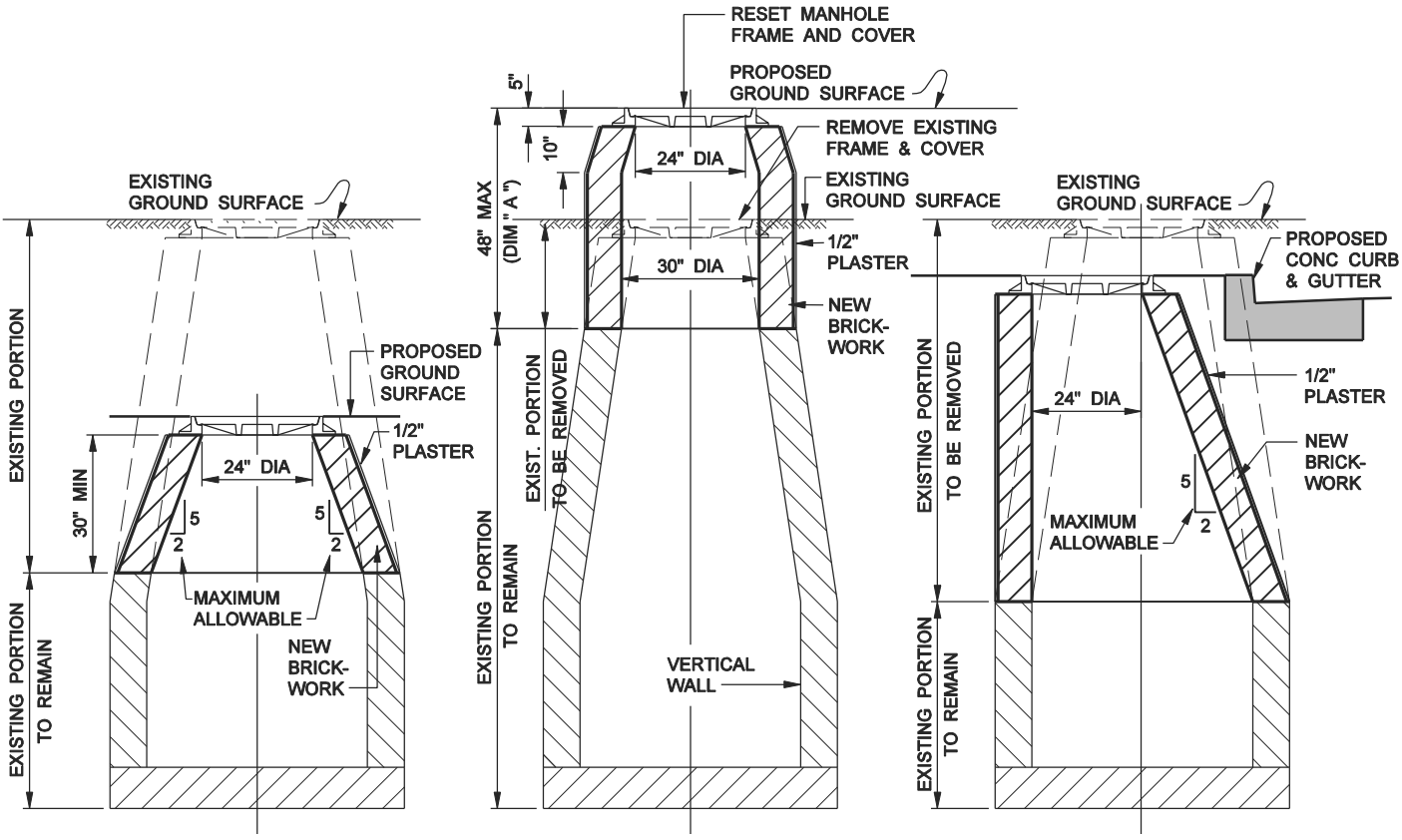
SHEET 1 OF 1



CASE I CASE II CASE III

NOTES:

1. PRIOR TO THE REMOVAL OF THE FRAME OF ANY MANHOLE, THE CHANNEL OF THE MANHOLE SHALL BE COMPLETELY COVERED WITH PLANKING OR OTHER SUITABLE MATERIAL SO AS TO PREVENT DEBRIS FROM ENTERING THE CHANNEL. AFTER THE MANHOLE RECONSTRUCTION HAS BEEN COMPLETED ALL DEBRIS SHALL BE REMOVED FROM WITHIN THE MANHOLE AND THE COVER OVER THE CHANNEL SHALL BE REMOVED.

2. WHEN THE MANHOLE IS TO BE RECONSTRUCTED TO A STRAIGHT SIDED MANHOLE, THE BRICK WORK SHALL BE REMOVED TO THE HIGHEST POINT OF THE VERTICAL WALL. THE SLOPE OF THE CORBELED SIDE SHALL NOT EXCEED 2 INCHES IN 5 INCHES. THE MANHOLE STEPS SHALL BE PLACED ON THE VERTICAL SIDE. SEE CASE III.

3. WHEN THE MANHOLE IS TO BE RAISED AN AMOUNT SUCH THAT DIMENSION "A" (CASE II) IS LESS THAN 4', THE BRICKWORK SHALL BE REMOVED TO A POINT WHERE THE INSIDE DIAMETER IS A MINIMUM OF 30 INCHES. THE MANHOLE WALL SHALL THEN BE CONSTRUCTED VERTICALLY TO A POINT 15 INCHES BELOW THE TOP OF THE MANHOLE. SEE CASE II.

4. WHERE THE MANHOLE IS TO BE RAISED SUCH THAT DIMENSION "A" (CASE II) WOULD EXCEED 4', THE BRICKWORK SHALL BE REMOVED TO THE HIGHEST POINT OF THE VERTICAL WALL AND THE MANHOLE RECONSTRUCTED PER S-a-201 OR S-a-204.

5. WHEN THE DEPTH OF THE MANHOLE TO BE LOWERED IS SUCH THAT THE MAXIMUM ALLOWABLE SLOPES FOR THE BRICKWORK SHOWN FOR CASE I WOULD BE EXCEEDED. THE MANHOLE SHALL BE RECONSTRUCTED AS A TYPE "C" MANHOLE PER S-a-203.

6. MANHOLE STEPS, PER S-a-209, SHALL BE PLACED UNIFORMLY SO AS NOT TO BE MORE THAN 16 INCHES APART WITH THE TOP STEP BEING 16 INCHES BELOW THE MANHOLE FRAME.

7. PRIOR TO COMMENCING WORK OF RECONSTRUCTION, THE CONTRACTOR SHALL CONTACT DISTRICTS' SUPERINTENDENT OF MAINTENANCE AT (323) 774-7272.

COUNTY SANITATION DISTRICTS OF LOS ANGELES COUNTY
OFFICE OF CHIEF ENGINEER

STEPHEN R. MAGUIN
CHIEF ENGINEER

STANDARD RECONSTRUCTION OF BRICK MANHOLES

STANDARD DRAWING
2009 EDITION
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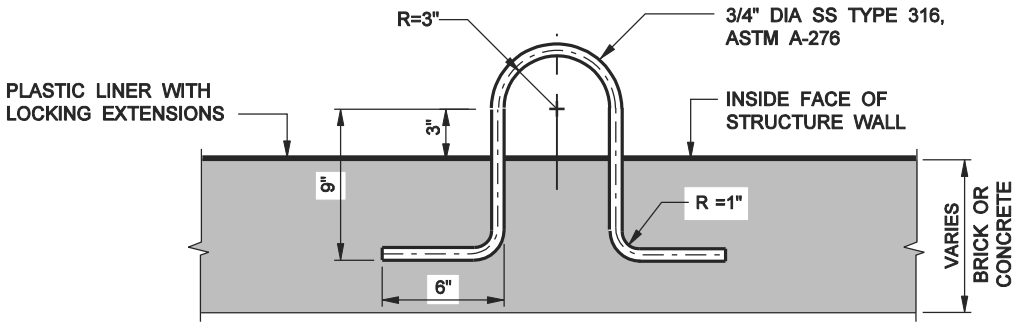
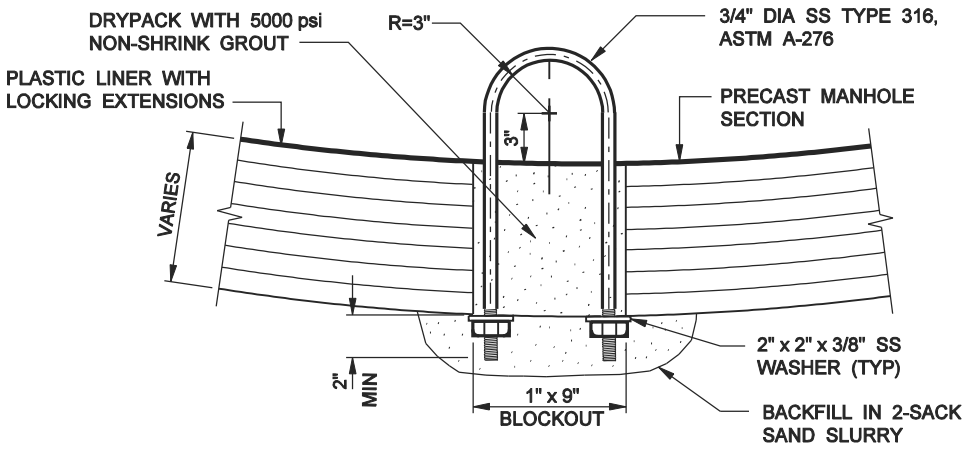
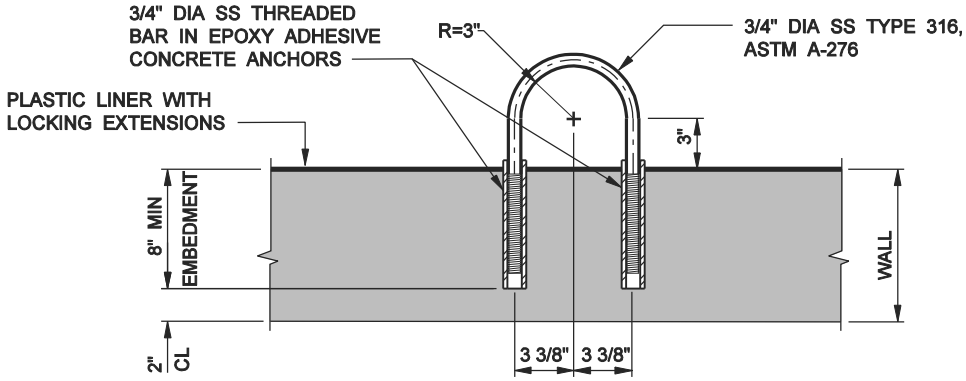
SHEET 1 OF 1



FOR CONCRETE STRUCTURE OR
TYPE "A" MANHOLE WALL



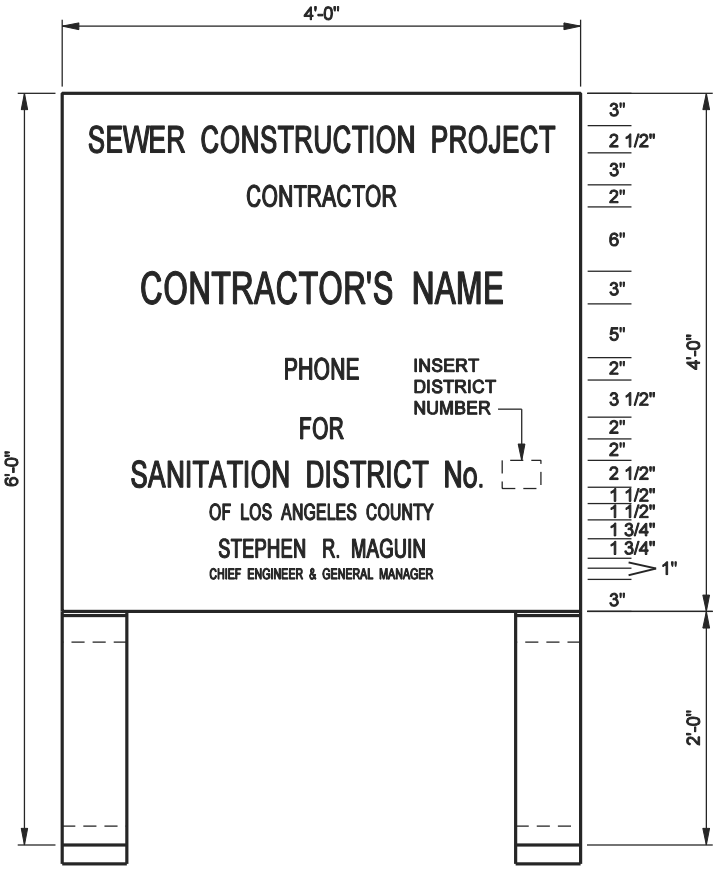
FOR PRECAST MANHOLE SECTION OR
CONCRETE WALL LESS THAN 8"



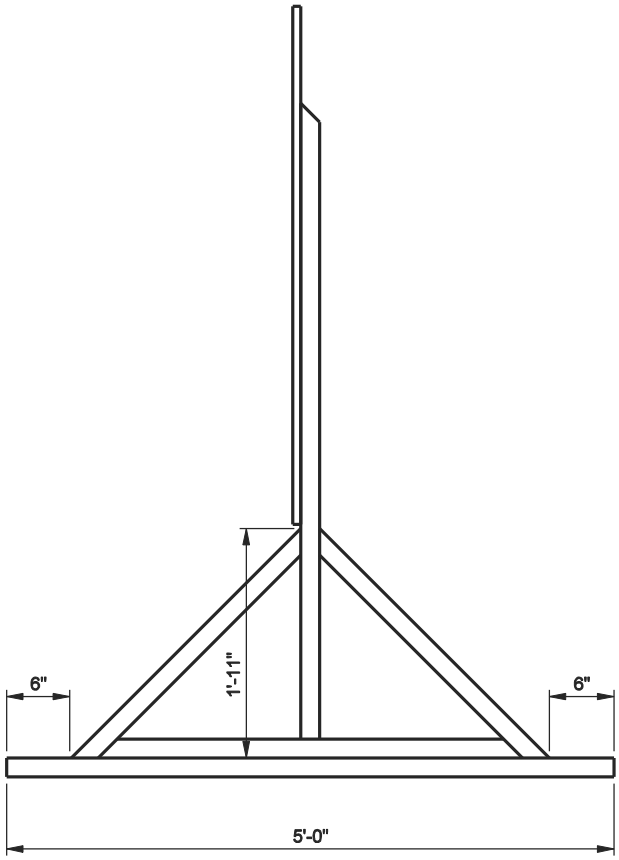
ALTERNATE PULL RING FOR
CONCRETE STRUCTURE

COUNTY SANITATION DISTRICTS OF LOS ANGELES COUNTY
OFFICE OF CHIEF ENGINEER

STEPHEN R. MAGUIN CHIEF ENGINEER	STANDARD PULL RING	STANDARD DRAWING 2009 EDITION S - a - 2 2 0 SHEET 1 OF 1



FRONT VIEW



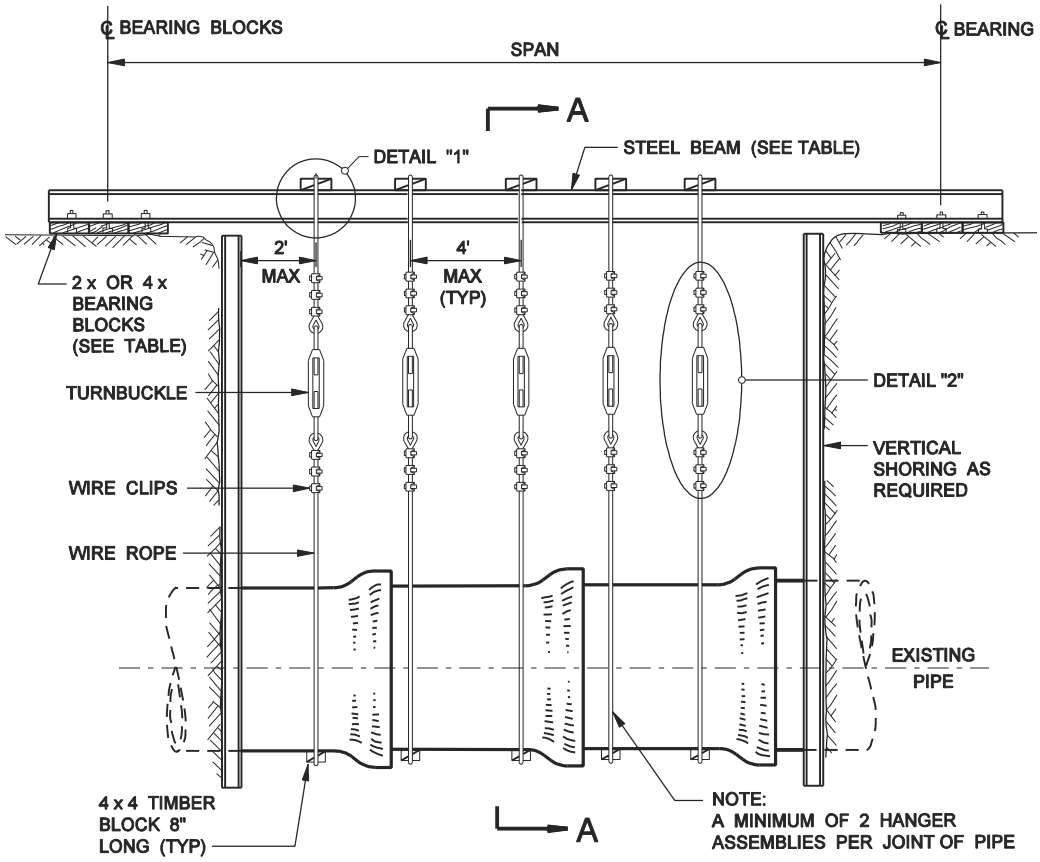
SIDE VIEW

NOTES:

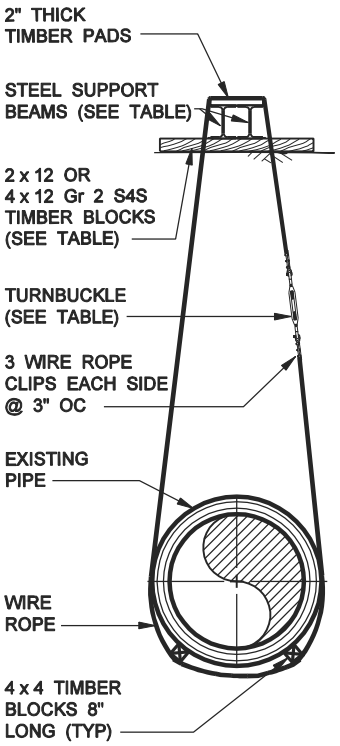
1. ALL FRAMING LUMBER SHALL BE 2" x 6" S4S D.F.
2. ENTIRE SIGN, INCLUDING FRAMING, SHALL BE PAINTED WITH TWO COATS OF EXTERIOR OIL BASE WHITE PAINT.
3. LETTERING SHALL BE DONE IN BLACK BY QUALIFIED SIGN PAINTER AND TO THE SATISFACTION OF THE ENGINEER.
4. SIGNS SHALL BE MAINTAINED IN A CONDITION SATISFACTORY TO THE ENGINEER.
5. SIGNS SHALL BE FURNISHED BY CONTRACTOR AND INSTALLED AND MOVED BY CONTRACTOR AS DIRECTED BY THE ENGINEER. NO CONSTRUCTION SHALL COMMENCE UNTIL SIGNS ARE IN PLACE. TWO REQUIRED.

COUNTY SANITATION DISTRICTS OF LOS ANGELES COUNTY
OFFICE OF CHIEF ENGINEER

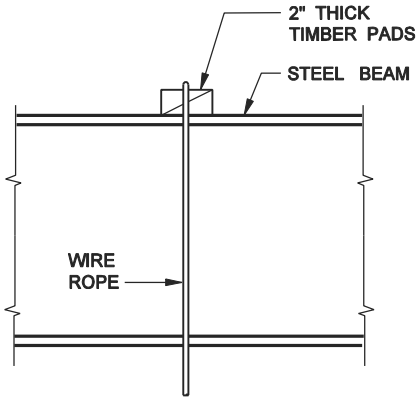
STEPHEN R. MAGUIN CHIEF ENGINEER	STANDARD PROJECT SIGN	STANDARD DRAWING 2006 EDITION S - a - 2 2 1 SHEET 1 OF 1



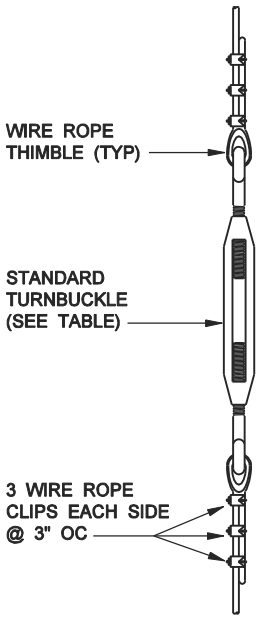
ELEVATION



SECTION A-A



DETAIL "1"



DETAIL "2"

COUNTY SANITATION DISTRICTS OF LOS ANGELES COUNTY
OFFICE OF CHIEF ENGINEER

STEPHEN R. MAGUIN
CHIEF ENGINEER

STANDARD TEMPORARY PIPE SUPPORT

STANDARD DRAWING
2009 EDITION
S - a - 2 2 2
SHEET 1 OF 2

TABLE OF MEMBER SIZES (PART I)							
PIPE SIZE	STEEL BEAMS SPAN					WIRE ROPE	TURNBUCKLE
	0' - 10'	11' - 15'	16' - 20'	21' - 30'	31' - 40'		
8" - 10"	w 6 x 9	w 6 x 9	w 6 x 9	w 8 x 18	w 10 x 22	3/8"	1/2"
12" - 15"	w 6 x 9	w 6 x 15	w 6 x 20	w 10 x 22	w 12 x 30	3/8"	1/2"
18" - 21"	w 6 x 9	w 8 x 18	w 8 x 24	w 10 x 33	w 12 x 53	3/8"	1/2"
24" - 27"	w 6 x 15	w 8 x 18	w 8 x 28	w 12 x 40	w 12 x 72	3/8"	1/2"
30"	w 6 x 15	w 8 x 18	w 8 x 31	w 12 x 53	2 - w 12 x 53	1/2"	5/8"
33"	w 8 x 18	w 8 x 24	w 10 x 33	w 12 x 65	2 - w 12 x 65	1/2"	5/8"
36"	w 8 x 18	w 10 x 22	w 10 x 33	w 12 x 72	2 - w 12 x 65	1/2"	5/8"
39"	w 8 x 18	w 10 x 22	w 10 x 39	w 12 x 72	2 - w 12 x 72	1/2"	5/8"
42"	w 8 x 18	w 10 x 22	w 10 x 49	w 12 x 79	2 - w 14 x 61	1/2"	5/8"
48"	w 8 x 18	w 12 x 30	w 12 x 53	——	——	1/2"	5/8"
54"	w 10 x 22	w 12 x 30	w 12 x 53	——	——	5/8"	3/4"
60"	w 10 x 22	w 12 x 40	w 12 x 65	——	——	5/8"	3/4"
66"	w 10 x 33	w 12 x 53	2 - w 12 x 53	——	——	5/8"	3/4"
72"	w 12 x 30	w 12 x 53	2 - w 12 x 65	——	——	5/8"	7/8"

TABLE OF MEMBER SIZES (PART II)					
PIPE SIZE	BEARING BLOCKS SPAN				
	0' - 10'	11' - 15'	16' - 20'	21' - 30'	31' - 40'
8" - 10"	1 - 2 x 12 x 2'	1 - 2 x 12 x 2'	2 - 2 x 12 x 2'	2 - 2 x 12 x 2'	2 - 2 x 12 x 2'
12" - 15"	1 - 2 x 12 x 2'	1 - 2 x 12 x 2'	2 - 2 x 12 x 2'	2 - 2 x 12 x 2'	2 - 4 x 12 x 3'
18" - 21"	1 - 2 x 12 x 2'	1 - 2 x 12 x 3'	2 - 2 x 12 x 3'	2 - 4 x 12 x 3'	2 - 4 x 12 x 4'
24" - 27"	1 - 2 x 12 x 3'	2 - 2 x 12 x 2'	2 - 2 x 12 x 3'	2 - 4 x 12 x 5'	3 - 4 x 12 x 4'
30"	1 - 2 x 12 x 3'	2 - 2 x 12 x 3'	2 - 4 x 12 x 4'	3 - 4 x 12 x 4'	3 - 4 x 12 x 5'
33"	2 - 2 x 12 x 2'	2 - 2 x 12 x 3'	2 - 4 x 12 x 4'	3 - 4 x 12 x 5'	3 - 4 x 12 x 6'
36"	2 - 2 x 12 x 2'	2 - 2 x 12 x 3'	2 - 4 x 12 x 4'	3 - 4 x 12 x 5'-6"	4 - 4 x 12 x 5'-6"
39"	2 - 2 x 12 x 3'	2 - 4 x 12 x 4'	2 - 4 x 12 x 5'	4 - 4 x 12 x 5'	4 - 4 x 12 x 6'
42"	2 - 2 x 12 x 3'	2 - 4 x 12 x 4'	2 - 4 x 12 x 5'	4 - 4 x 12 x 5'-6"	4 - 4 x 12 x 6'-6"
48"	2 - 4 x 12 x 4'	2 - 4 x 12 x 5'	3 - 4 x 12 x 5'	——	——
54"	2 - 4 x 12 x 4'	2 - 4 x 12 x 5'	3 - 4 x 12 x 5'	——	——
60"	2 - 4 x 12 x 4'	3 - 4 x 12 x 5'	3 - 4 x 12 x 5'	——	——
66"	2 - 4 x 12 x 5'	3 - 4 x 12 x 5'	3 - 4 x 12 x 6'	——	——
72"	2 - 4 x 12 x 5'	3 - 4 x 12 x 5'	4 - 4 x 12 x 5'	——	——

NOTES:

1. FORTY-EIGHT HOURS PRIOR TO COMMENCING CONSTRUCTION OF THE TEMPORARY SUPPORT, THE CONTRACTOR SHALL CONTACT THE DISTRICT SUPERINTENDENT OF MAINTENANCE AT (323) 774-7272.
2. APPROVAL SHALL BE OBTAINED FROM THE COUNTY SANITATION DISTRICT REPRESENTATIVE OF THE SPAN TO BE USED IN DETERMINING THE SIZE OF THE STEEL BEAM.
3. ALL WORK ON THE TEMPORARY SUPPORT SHALL BE DONE ONLY IN THE PRESENCE OF THE COUNTY SANITATION DISTRICT REPRESENTATIVE.
4. THE CONTRACTOR SHALL BE COMPLETELY RESPONSIBLE FOR THE ADEQUACY OF THE TEMPORARY SUPPORT AND FOR THE MANNER IN, WHICH IT IS INSTALLED.
5. FOR PIPES AND MEMBER SIZES NOT SHOWN IN THE ABOVE TABLES, THE CONTRACTOR SHALL SUBMIT DETAILS OF THE PROPOSED SUPPORT AND CALCULATIONS PREPARED BY CIVIL / STRUCTURAL ENGINEER REGISTERED IN THE STATE OF CALIFORNIA TO THE COUNTY SANITATION DISTRICT REPRESENTATIVE FOR WRITTEN APPROVAL PRIOR TO COMMENCING CONSTRUCTION.
6. APPROVAL SHALL BE OBTAINED FROM THE COUNTY SANITATION DISTRICT REPRESENTATIVE PRIOR TO USING MEMBERS OR PARTS OF THE TEMPORARY SUPPORT DIFFERENT THAN DETAILED.
7. LARGER STEEL BEAMS WITH CORRESPONDINGLY LARGER SECTION MODULI MAY BE SUBSTITUTED.

COUNTY SANITATION DISTRICTS OF LOS ANGELES COUNTY
OFFICE OF CHIEF ENGINEER

STEPHEN R. MAGUIN
CHIEF ENGINEER

STANDARD TEMPORARY PIPE SUPPORT

STANDARD DRAWING
2009 EDITION
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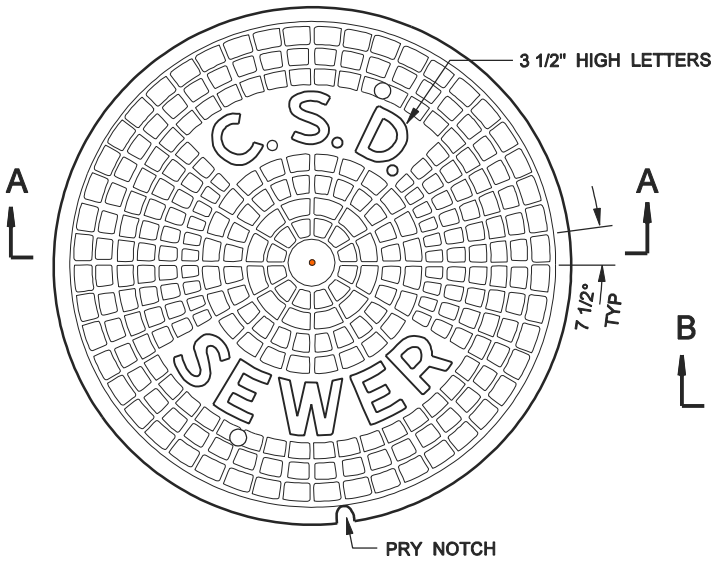
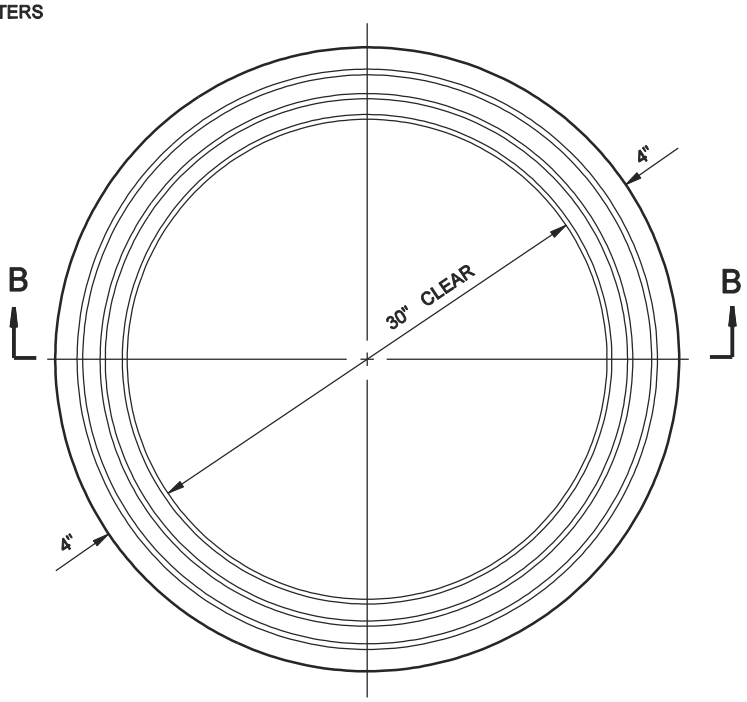
SHEET 2 OF 2

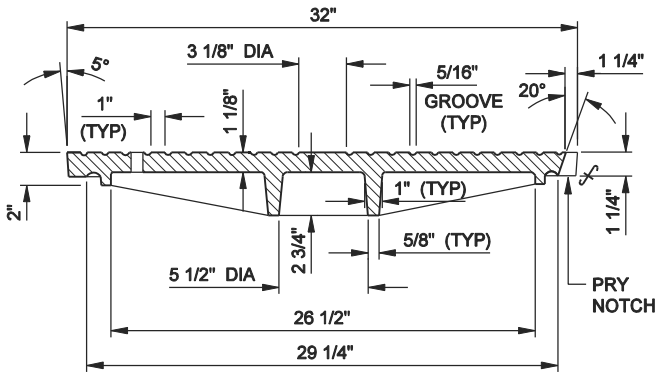


PLAN OF COVER

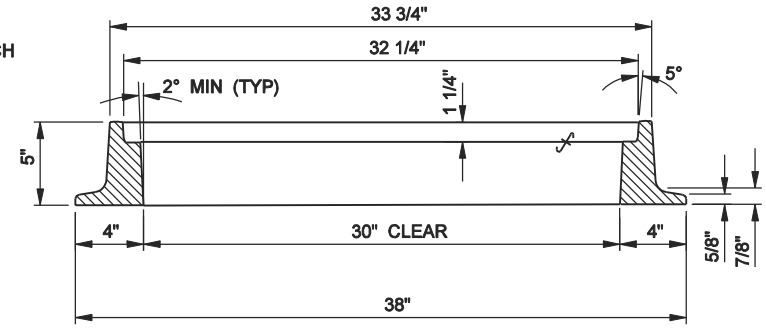
TOP VIEW



PLAN OF FRAME



SECTION A-A



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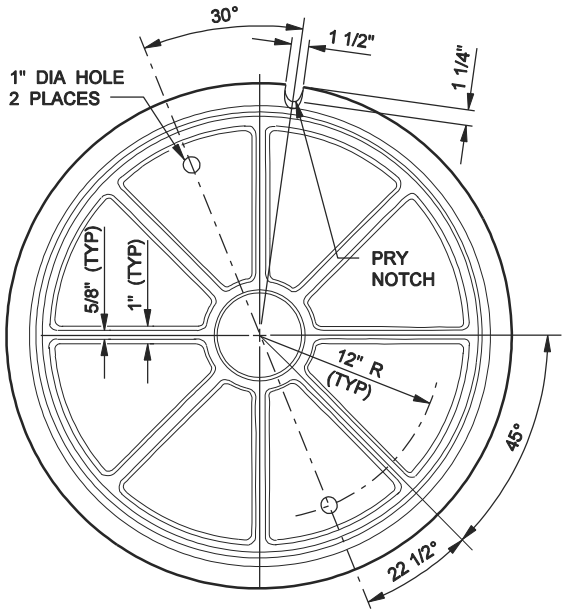


PLAN OF COVER

BOTTOM VIEW

NOTES:

1. CAST IRON USED SHALL CONFORM TO 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

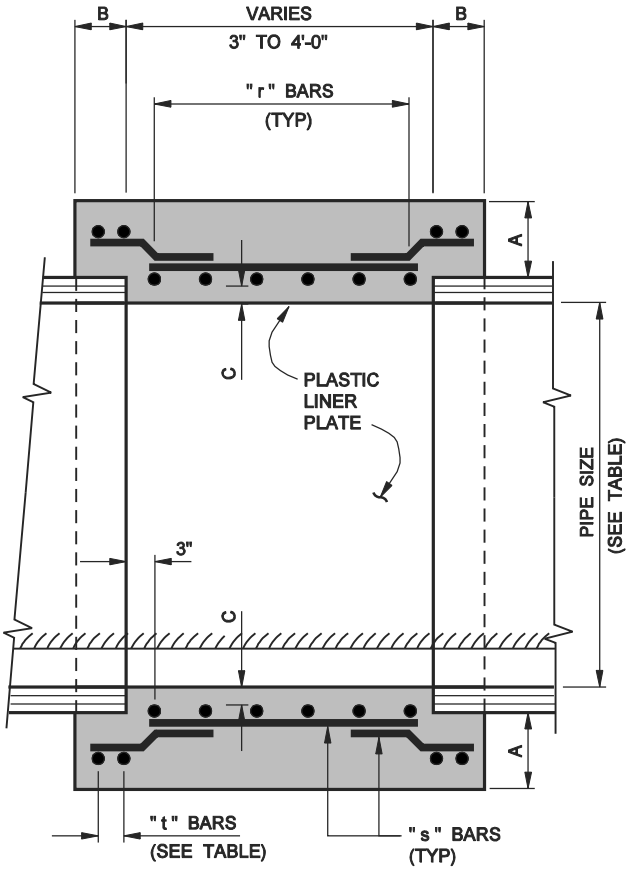
STEPHEN R. MAGUIN
CHIEF ENGINEER

STANDARD 30" MANHOLE FRAME AND COVER

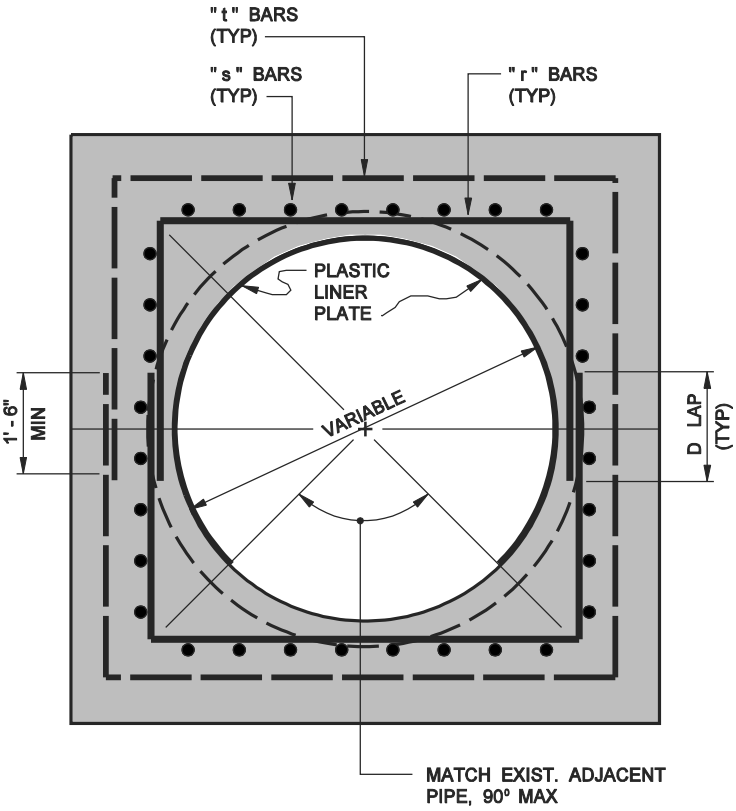
STANDARD DRAWING
2009 EDITION

S - a - 2 2 3

SHEET 1 OF 1



LONGITUDINAL SECTION



CROSS SECTION

TABLE OF REINFORCING BARS

PIPE SIZE	DEPTH TO INVERT	DIMENSIONS				REINFORCING BARS		
		A	B	C	D	"r"	"s"	"t"
24" TO 33"	0' TO 15'	6"	8"	3"	16"	#4 @ 10"	#4 @ 12	2 - #4
	16' TO 30'							
36"	0' TO 15'	6"	8"	3"	16"	#4 @ 10	#4 @ 12	2 - #4
	16' TO 30'					#4 @ 8		
39"	0' TO 15'	6"	8"	3"	16"	#4 @ 10	#4 @ 12	2 - #4
	16' TO 30'					#4 @ 6		
42"	0' TO 15'	7"	8"	3"	16"	#4 @ 10	#5 @ 12	2 - #5
	16' TO 30'				20"	#5 @ 10		
48"	0' TO 15'	7"	8"	4"	16"	#4 @ 10	#5 @ 12	2 - #5
	16' TO 30'				20"	#5 @ 8		
54"	0' TO 15'	7"	8"	4"	16"	#4 @ 8	#5 @ 12	2 - #5
	16' TO 30'				20"	#5 @ 8		
60"	0' TO 15'	8"	8"	4"	16"	#4 @ 6	#5 @ 12	2 - #5
	16' TO 30'				24"	#6 @ 8		
66"	0' TO 15'	8"	10"	5"	20"	#5 @ 8	#5 @ 12	3 - #5
	16' TO 30'				28"	#7 @ 8		
72"	0' TO 15'	8"	10"	5"	20"	#5 @ 8	#5 @ 12	3 - #5
	16' TO 30'				28"	#7 @ 6		
84"	0' TO 15'	9"	12"	5"	20"	#5 @ 8	#5 @ 12	3 - #6
	15' TO 30'				28"	#7 @ 6		
96"	0' TO 15'	9"	12"	6"	20"	#5 @ 6	#5 @ 9	3 - #6
	15' TO 30'				28"	#7 @ 6		

NOTES:

1. CONCRETE SHALL BE 660-B-4000.
2. ALL REINFORCING BARS SHALL BE ASTM A-706, CLASS 60.
3. THE CONCRETE SHALL BE CONSOLIDATED BY MEANS OF HIGH FREQUENCY INTERNAL VIBRATORS.
4. DETAIL APPLIES FOR PIPES WITH COVER FROM 3'-0" TO 30'-0" FOR TRENCH CONDITION AND FOR PIPES WITH COVER 3'-0" TO 10'-0" FOR EMBANKMENT CONDITION.
5. PIPE BARRELLING SHALL BE DONE AT LOCATIONS AND LENGTHS SHOWN ON THE DRAWINGS OR AUTHORIZED BY THE ENGINEER.

COUNTY SANITATION DISTRICTS OF LOS ANGELES COUNTY
OFFICE OF CHIEF ENGINEER

STEPHEN R. MAGUIN
CHIEF ENGINEER

STANDARD PIPE BARREL

STANDARD DRAWING
2009 EDITION
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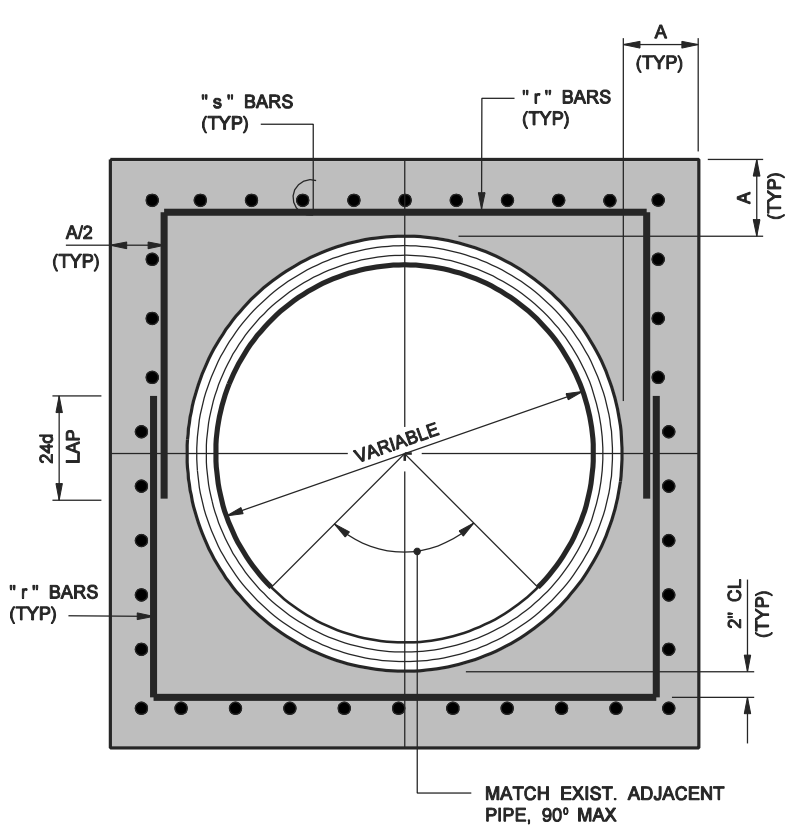

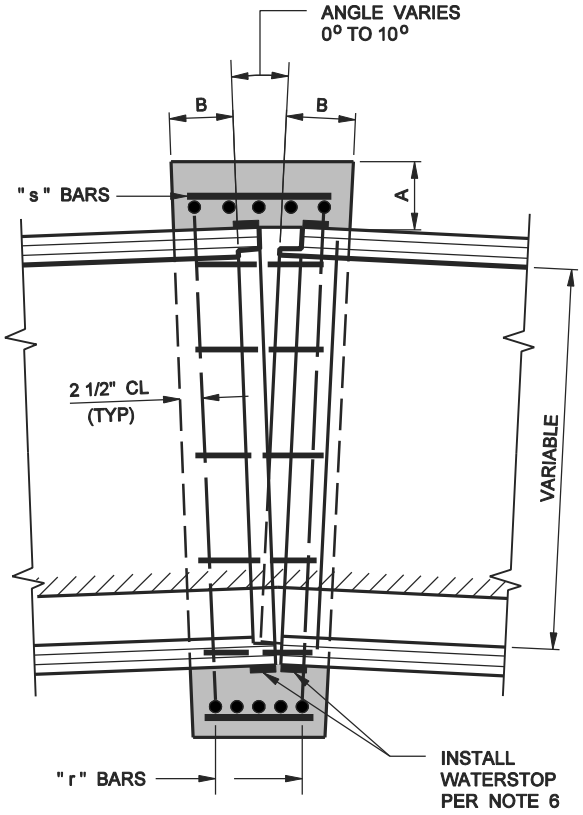

CROSS SECTION

LONGITUDINAL SECTION

TABLE OF REINFORCING BARS				
PIPE DIAMETER	DIMENSIONS		REINFORCING BARS	
	A	B	"r"	"s"
24" TO 36"	8"	8"	#4 @ 8	#4 @ 12
39" TO 57"	8"	10"	#6 @ 8	#5 @ 12
60" TO 78"	10"	12"	#7 @ 6	#5 @ 12
84" TO 96"	12"	16"	#7 @ 6	#5 @ 9"

NOTES:

1. CONSTRUCT CONCRETE COLLAR WHERE REQUIRED ON THE DRAWINGS AND AT ALL PIPE JOINTS WHERE THERE IS A CHANGE IN THE TYPE OF JOINT OR A CHANGE IN THE THICKNESS OF THE WALLS OF ADJACENT PIPES.
2. UNLESS OTHERWISE SPECIFIED, CONCRETE SHALL BE 660-B-4000 AND ALL REINFORCING BARS SHALL BE DEFORMED BARS CONFORMING TO ASTM-A706 GRADE 60.
3. EXTERIOR SURFACES OF CONCRETE PIPE SHALL BE CLEANED BY SANDBLASTING PRIOR TO PLACING CONCRETE.
4. THE CONTRACTOR SHALL SUBMIT WORKING DRAWINGS THAT SHOW DETAILS FOR JOINING ANY PLASTIC LINERS IN ADJACENT PIECES OF PIPE.
5. FOR VITRIFIED CLAY PIPE HAVING NO ANGULAR DEFLECTION, THE CONTRACTOR MAY USE A REPAIR COUPLING AND OMIT THE REINFORCING STEEL FROM THE CONCRETE COLLAR. THE REPAIR COUPLING SHALL INCLUDE AN INTEGRAL SHEAR BAND. DETAILS OF THE REPAIR COUPLING SHALL BE SUBMITTED TO THE DISTRICTS FOR APPROVAL.
6. HYDROTITE CJ - 2010 - 2 / 6 HYDROPHILIC WATERSTOP OR ADEKA MC 2010M OR EQUIVALENT. INSTALL ALL AROUND EACH PIPE.

COUNTY SANITATION DISTRICTS OF LOS ANGELES COUNTY
OFFICE OF CHIEF ENGINEER

STEPHEN R. MAGUIN
CHIEF ENGINEER

STANDARD CONCRETE COLLAR

STANDARD DRAWING
2009 EDITION
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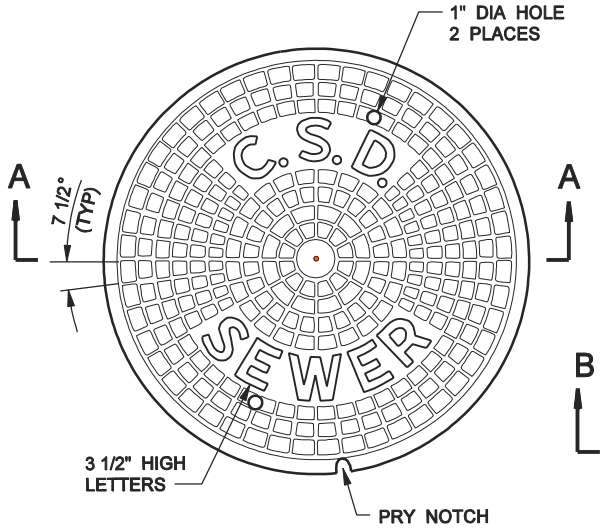
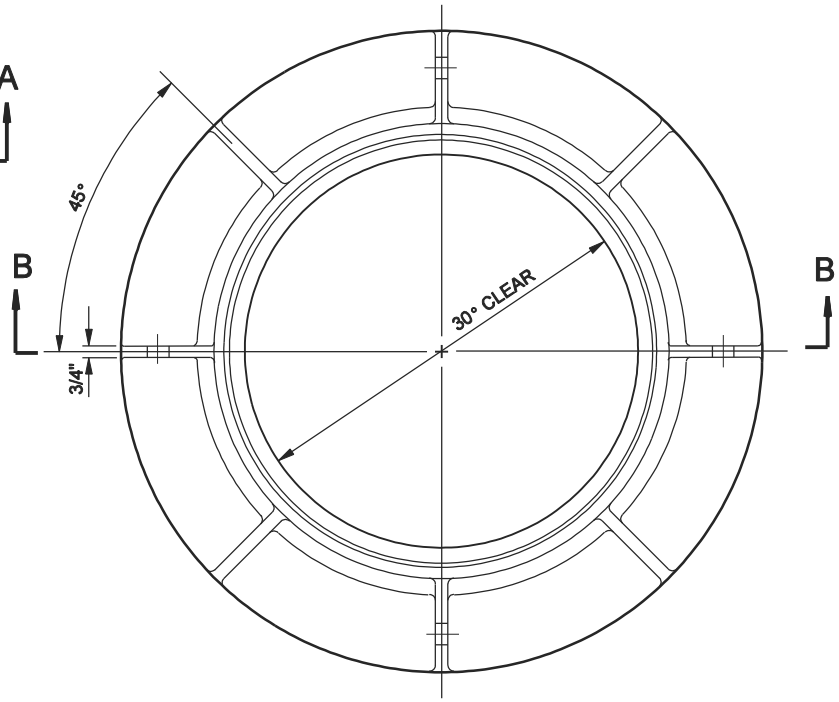
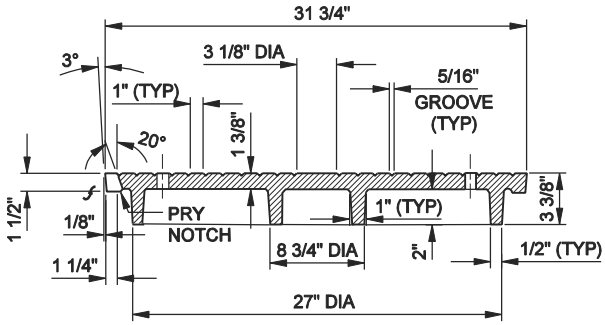
SHEET 1 OF 1



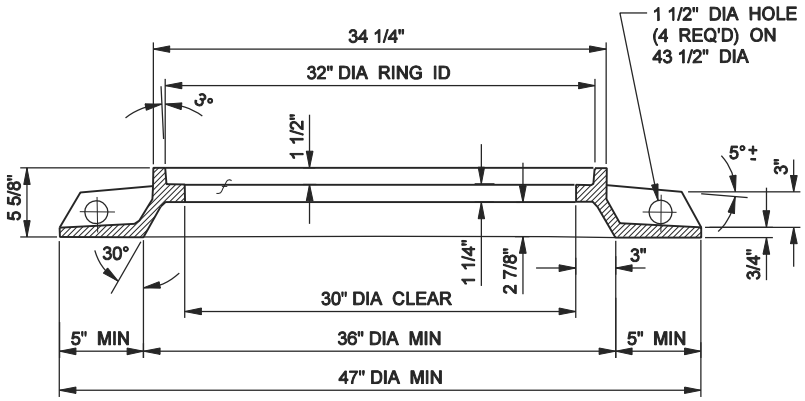
PLAN OF COVER
TOP VIEW



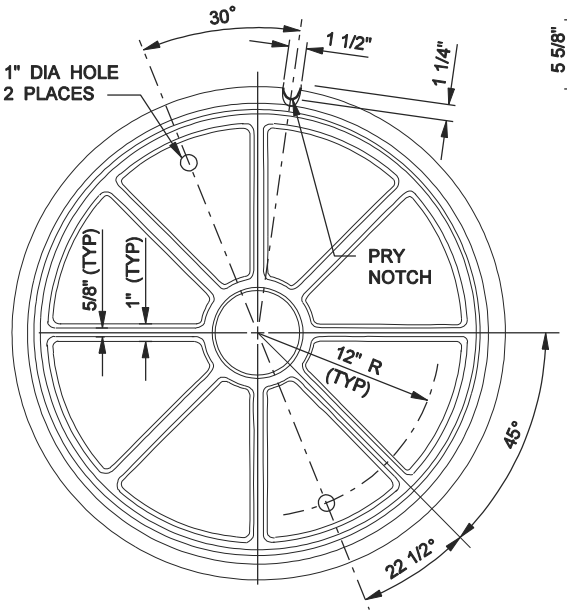
PLAN OF FRAME



SECTION A-A



SECTION B-B



PLAN OF COVER
BOTTOM VIEW

NOTES:

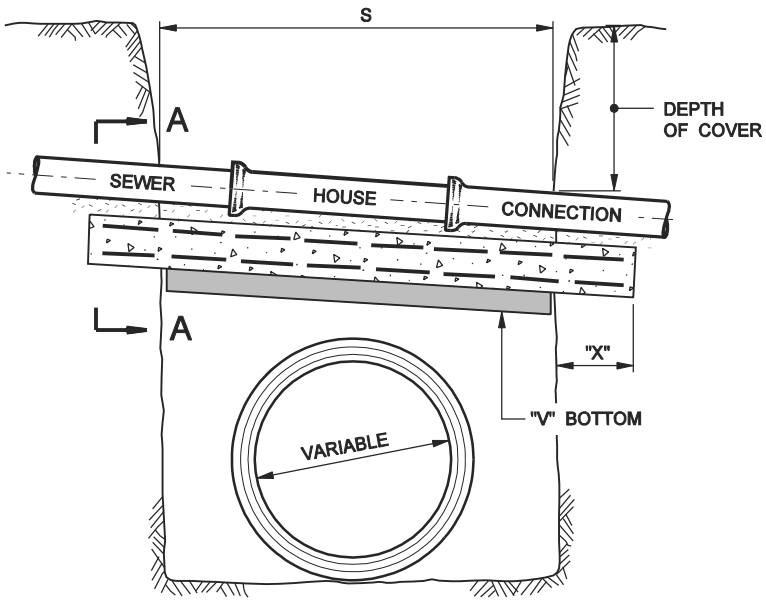
1. CAST IRON USED SHALL CONFORM TO ASTM A-48 CLASS 35B.
2. FRAME AND COVER SHALL BE COATED WITH ASPHALTUM OR BITUMINOUS PAINT AFTER TESTING AND INSPECTION.
3. FRAME AND COVER SHALL BE TESTED FOR ACCURATE FIT PRIOR TO DELIVERY AND SHALL BE MARKED IN SETS.
4. ALL CASTINGS SHALL COMPLY WITH SECTION 206-3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

COUNTY SANITATION DISTRICTS OF LOS ANGELES COUNTY
OFFICE OF CHIEF ENGINEER

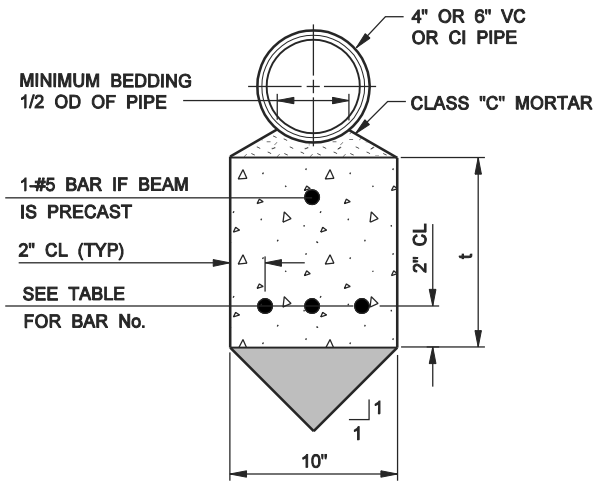
STEPHEN R. MAGUIN
CHIEF ENGINEER

STANDARD 36" MANHOLE FRAME WITH 30" COVER

STANDARD DRAWING
2009 EDITION
S - a - 2 2 6
SHEET 1 OF 1



ELEVATION



SECTION A-A

DIMENSIONS OF REINFORCED CONCRETE BEAM				
S (FEET)	DEPTH OF COVER			
	0 TO 8'-0"		8'-1" TO 16'-0"	
	t	BAR No	t	BAR No.
4	8"	4	10"	5
5	9"	5	12"	5
6	10"	5	13"	6
7	11"	6	15"	6
8	12"	6	16"	6
9	13"	6	17"	7
10	14"	7	19"	7
11	15"	7	20"	7
12	16"	7	22"	7
13	17"	7	23"	8
14	18"	8	25"	8
15	19"	8	26"	8
16	20"	8	—	—
17	21"	8	—	—
18	22"	8	—	—

NOTE:

BEAM CONCRETE SHALL BE 660-B-4000. ALL REINFORCING BARS SHALL BE DEFORMED BARS CONFORMING TO ASTM-A706 GRADE 60. A "V" BOTTOMED BEAM AS DETAILED ABOVE SHALL BE POURED IN PLACE OR, IF APPROVED BY THE ENGINEER. A RECTANGULAR PRECAST BEAM SHALL BE PLACED ON BACKFILL WHICH HAS BEEN PREVIOUSLY CONSOLIDATED TO THE INVERT OF THE HOUSE CONNECTION AND REEXCAVATED TO ACCOMMODATE THE BEAM. IN EITHER CASE, THE BEAM SHALL BEAR ON UNDISTURBED OR CONSOLIDATED SOIL.

MINIMUM LENGTH OF BEARING OF ENDS OF REINFORCED CONCRETE BEAMS		
DEPTH OF COVER	S	MIN BEARING - "X"
0 TO 8'-0"	0 TO 12'-0"	18"
	12'-1" TO 18'-0"	24"
8'-1" TO 16'-0"	0 TO 7'-0"	18"
	7'-1" TO 11'-0"	24"
	11'-1" TO 15'-0"	30"

COUNTY SANITATION DISTRICTS OF LOS ANGELES COUNTY
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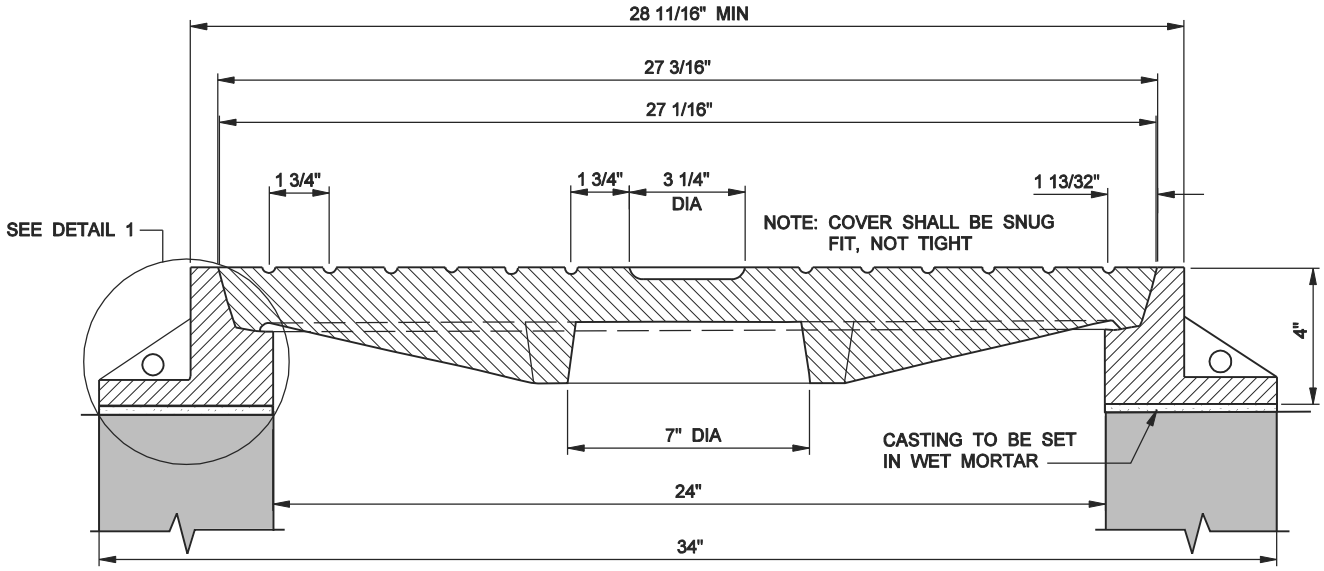
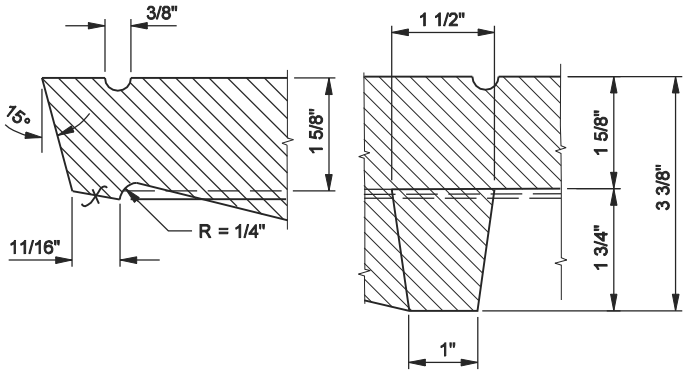
STEPHEN R. MAGUIN
CHIEF ENGINEER

STANDARD CONCRETE BEAM FOR HOUSE CONNECTIONS

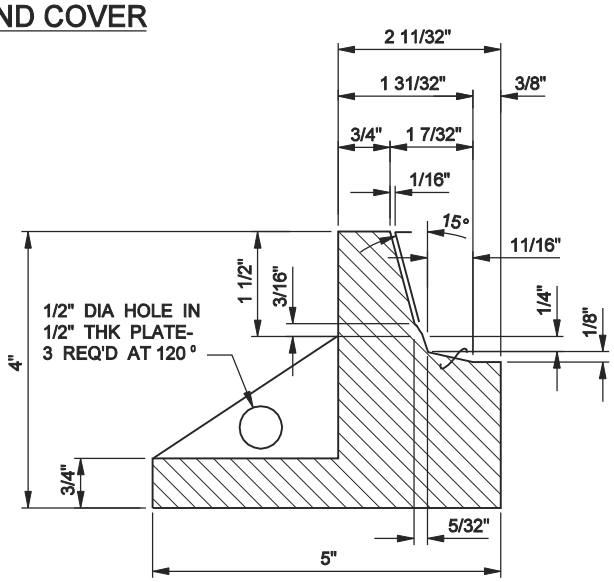
STANDARD DRAWING
2009 EDITION
S - a - 2 2 7
SHEET 1 OF 1



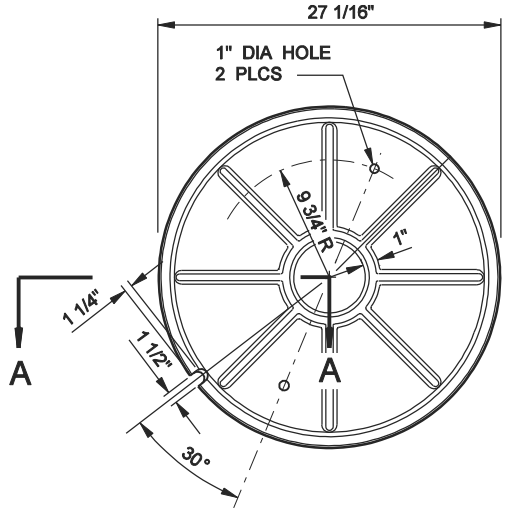
SECTION
MANHOLE FRAME AND COVER



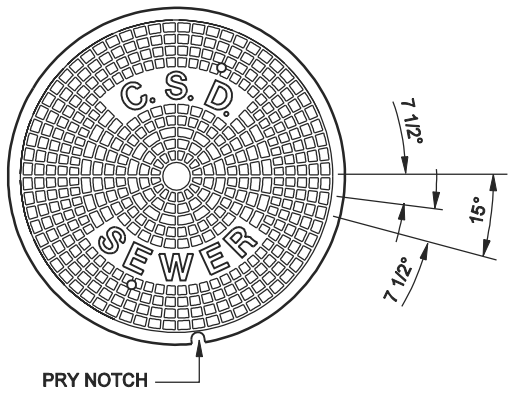
SECTION A-A



DETAIL 1



PLAN OF COVER
BOTTOM VIEW



PLAN OF COVER
TOP VIEW

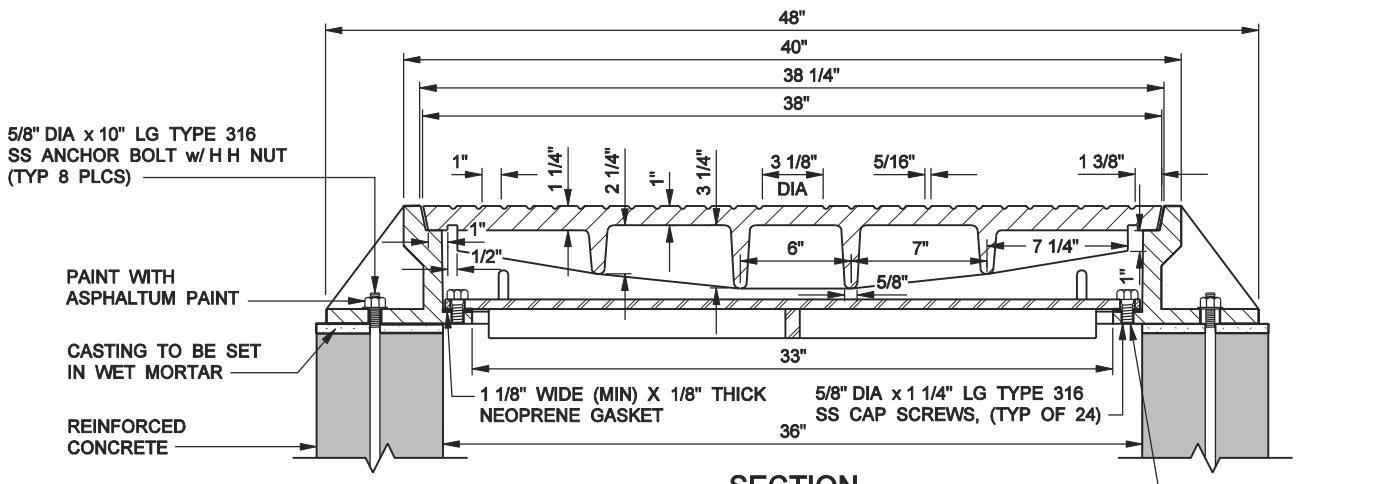
NOTE:
FOR NOTES SEE S-a-207.

COUNTY SANITATION DISTRICTS OF LOS ANGELES COUNTY
OFFICE OF CHIEF ENGINEER

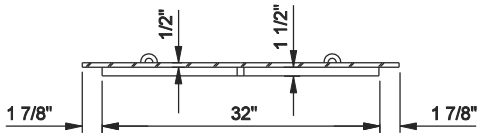
STEPHEN R. MAGUIN
CHIEF ENGINEER

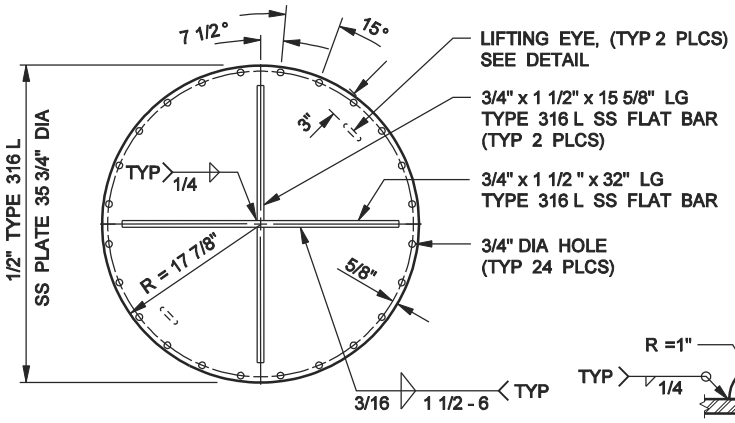
STANDARD 24" TRAFFIC MANHOLE FRAME AND COVER

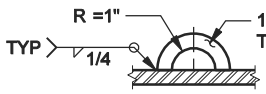
STANDARD DRAWING
2009 EDITION
S - a - 2 2 8
SHEET 1 OF 1

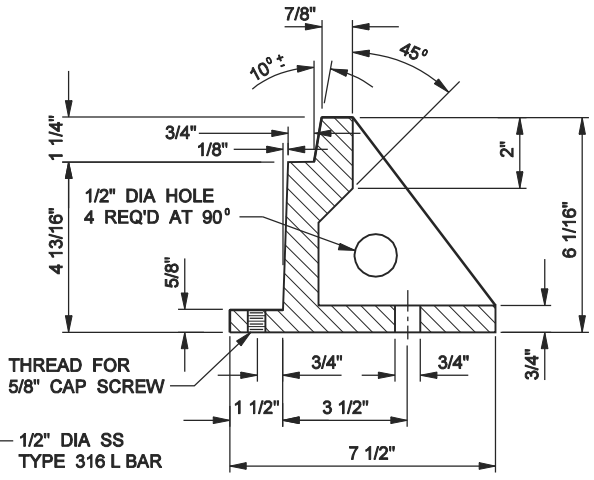


SECTION
MANHOLE FRAME AND COVER





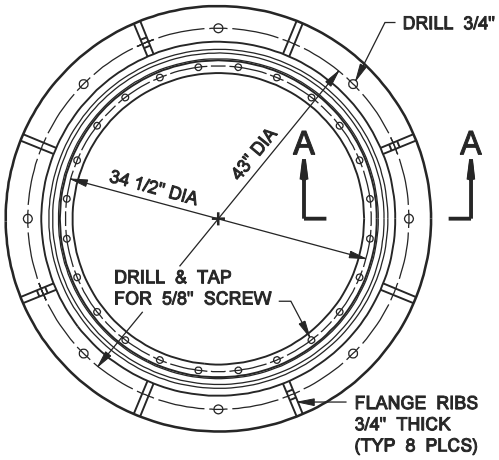




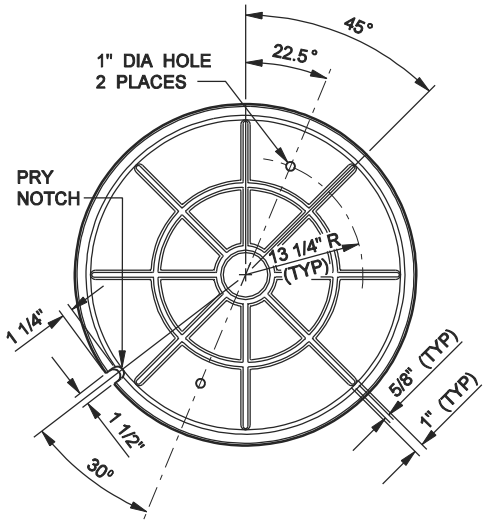
PRESSURE PLATE
BOTTOM VIEW

DETAIL- LIFTING EYE

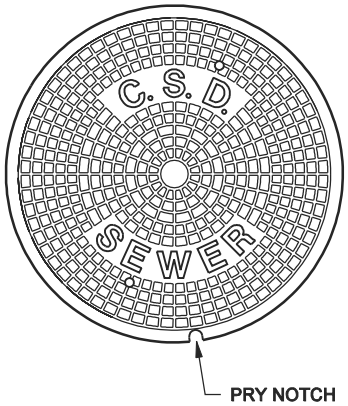
SECTION A-A



PLAN OF FRAME



PLAN OF COVER
BOTTOM VIEW



PLAN OF COVER
TOP VIEW

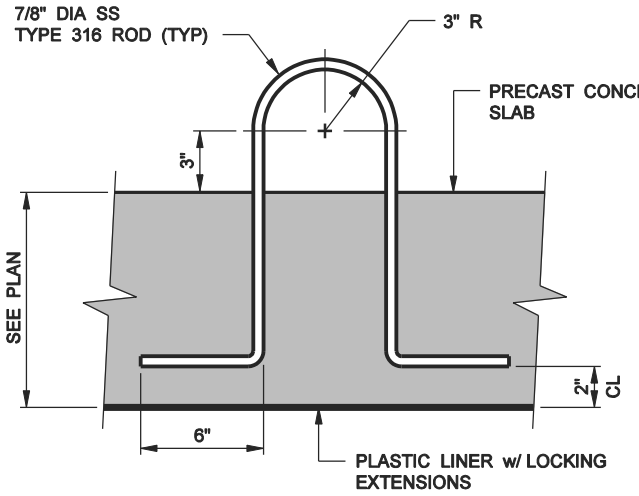
NOTE:
FOR NOTES SEE S-a-207.

COUNTY SANITATION DISTRICTS OF LOS ANGELES COUNTY
OFFICE OF CHIEF ENGINEER

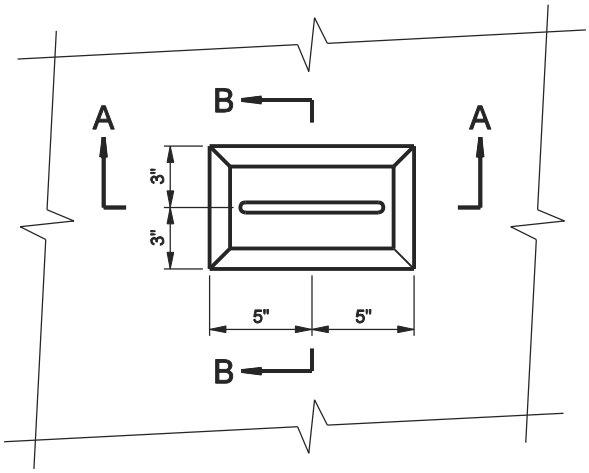
STEPHEN R. MAGUIN
CHIEF ENGINEER

STANDARD 36" PRESSURE MANHOLE FRAME AND COVER

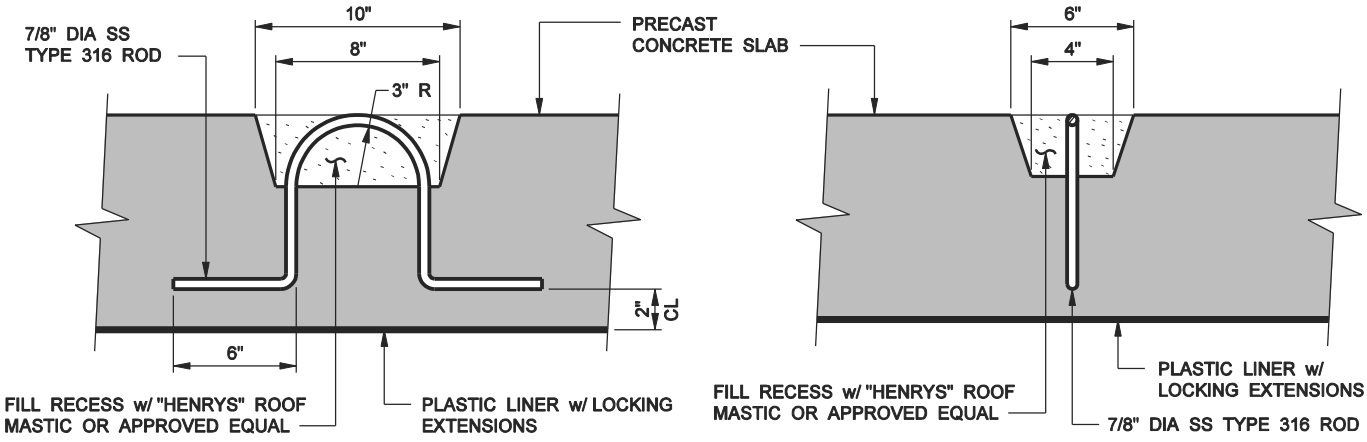
STANDARD DRAWING
2009 EDITION
S - a - 2 2 9
SHEET 1 OF 1



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 2009 EDITION S - a - 2 3 0 SHEET 1 OF 1