

STANDARD



**M S D**

WASTEWATER  
ENGINEERING

DRAWINGS

THOMAS SCHWIERS, P.E.  
RALPH JOHNSTONE, P.E.

LAST UPDATE:  
AUGUST 2011

INDEX

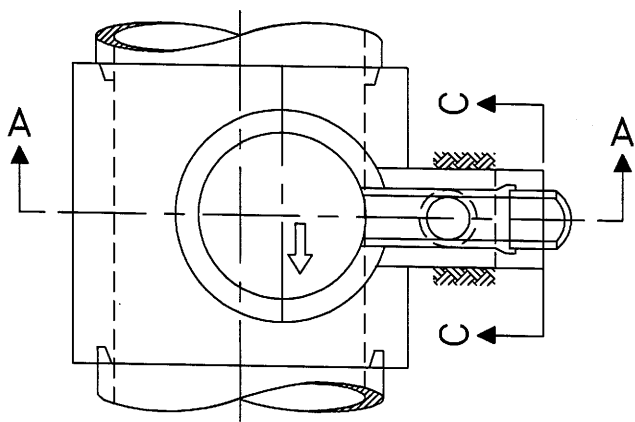
METROPOLITAN SEWER DISTRICT  
STANDARD SANITARY DRAWINGS

<u>ACC.NO. 49003</u>	<u>Standard Drop Manhole</u>
<u>ACC.NO. 49003A</u>	<u>Standard Precast Concrete Drop Manhole</u>
<u>ACC.NO. 49004</u>	<u>Typical Inverts</u>
<u>ACC.NO. 49005</u>	<u>Standard Casting For Manholes</u>
<u>ACC.NO. 49006</u>	<u>Standard Casting Manhole Frame – Type “A”</u>
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<u>ACC.NO. 49026</u>	<u>Standard Interceptor Inlet Frame</u>
<u>ACC.NO. 49027</u>	<u>Standard Interceptor Inlet Grating</u>
<u>ACC.NO. 49029</u>	<u>Structural Dimensions and Steel Details for Reinforced Concrete Junction Chambers</u>
<u>ACC.NO. 49031</u>	<u>Standard Concrete Collars on Conduits</u>
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<u>ACC.NO. 49033</u>	<u>Typical Building Sewers and Stacks</u>
<u>ACC.NO. 49037</u>	<u>Standard Manhole on Sanitary Conduits 42” and Under (Type “S”)</u>
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<u>ACC.NO. 49040A</u>	<u>Standard Precast Manhole Tee (Type “T” Alternate)</u>
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<u>ACC.NO. 49046</u>	<u>Standard Manhole for Sanitary Conduits on Steep Slopes</u>
<u>ACC.NO. 49047</u>	<u>Standard Two Way Cleanout on Storm Taps</u>
<u>ACC.NO. 49048</u>	<u>Modified Type “T” Manholes</u>
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<u>ACC.NO. 49051</u>	<u>Watertight Lid</u>
<u>ACC.NO. 49052</u>	<u>Special Detail for Laying Two Building Sewers in One Trench</u>
<u>ACC.NO. 49053</u>	<u>Standard Connection to Existing Brick Sewer</u>

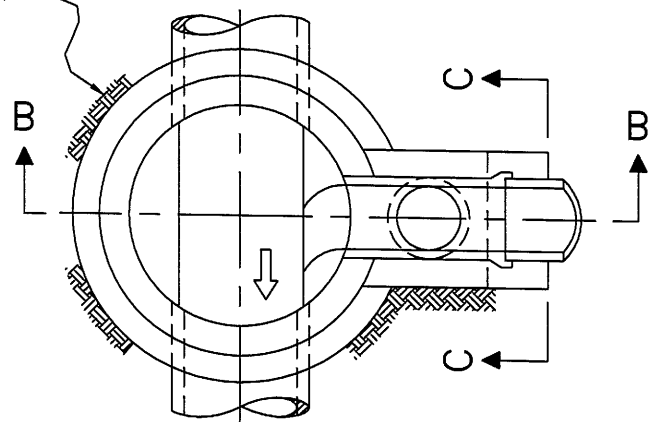
<u>ACC.NO. 49054</u>	<u>Standard Batter Board</u>
<u>ACC.NO. 49054A</u>	<u>Alternate Batter Board</u>
<u>ACC.NO. 49055</u>	<u>Self-Sealing Manhole Lid</u>
<u>ACC.NO. 49056</u>	<u>Standard Precast Concrete Manhole Base</u>
<u>ACC.NO. 49057</u>	<u>Typical Encasement for Existing Sanitary Pipe</u>
<u>ACC.NO. 49058</u>	<u>Sanitary Manhole Adjustment Using Brick and Mortar Prior to Machine Paving</u>
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<u>ACC.NO. 49059D</u>	<u>Standard Type “D” Sampling And Gauging Manhole</u>
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<u>ACC.NO. 49060</u>	<u>Typical Installation of Building Sewer Lateral</u>
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<u>ACC.NO. 49063</u>	<u>Low Pressure Force Main Typical Receiving Manhole</u>
<u>ACC.NO. 49067</u>	<u>Standard Separation Manhole</u>
<u>ACC.NO. 49068</u>	<u>Standard Monitoring Manhole</u>
<u>ACC.NO. 49069</u>	<u>Standard Building Connection to a Low Pressure Force Main</u>
<u>ACC.NO. 49072</u>	<u>Standard Symbols</u>
<u>ACC.NO. 49073</u>	<u>Standard Symbols</u>
<u>ACC.NO. 49074</u>	<u>Standard Symbols</u>
<u>ACC.NO. 49075</u>	<u>Standard Symbols</u>
<u>ACC.NO. 49076</u>	<u>Standard Symbols</u>
<u>ACC.NO. 60866</u>	<u>Standard Manhole Cover on Elevated Cones</u>
<u>ACC.NO. 60867</u>	<u>Standard Watertight Manhole Cover on Elevated Cones</u>
<u>ACC.NO. 60870</u>	<u>Standard Grease Interceptor</u>
<u>ACC.NO. 61307</u>	<u>Unreinforced Concrete Cap</u>
<u>ACC.NO. 61979</u>	<u>Standard Two Way Cleanout for Building Sewers</u>
<u>ACC.NO. 61979-A</u>	<u>Standard Castings over Two Way Cleanout</u>
<u>ACC.NO. 61980</u>	<u>Standard Lid on Private Sewers</u>
<u>ACC.NO. 61980-A</u>	<u>Standard Watertight Lid on Private Sewers</u>

NOTE:

SMU drawings can be found in the back of this book.  
Low Pressure Force Main Booklet also available.



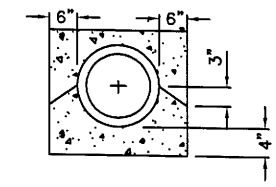
INDICATES  
UNDISTURBED  
EARTH—



NOTES:

DROP MANHOLES SHALL ONLY  
BE USED WHERE APPROVED  
BY M.S.D.

THE SEAL BETWEEN PRE-CAST MANHOLE  
BASE (RISER) AND INFLUENT AND/OR  
EFFLUENT CONDUIT SHALL BE A RUBBER  
GASKET, "A-LOK", "KOR-N-SEAL",  
"DURA-SEAL" OR AN APPROVED EQUAL.



SECTION C-C

ALL OTHER CHARACTERISTICS ARE SIMILAR  
TO STANDARD MANHOLE ACC. NO. 49037,  
49040 OR 49049.

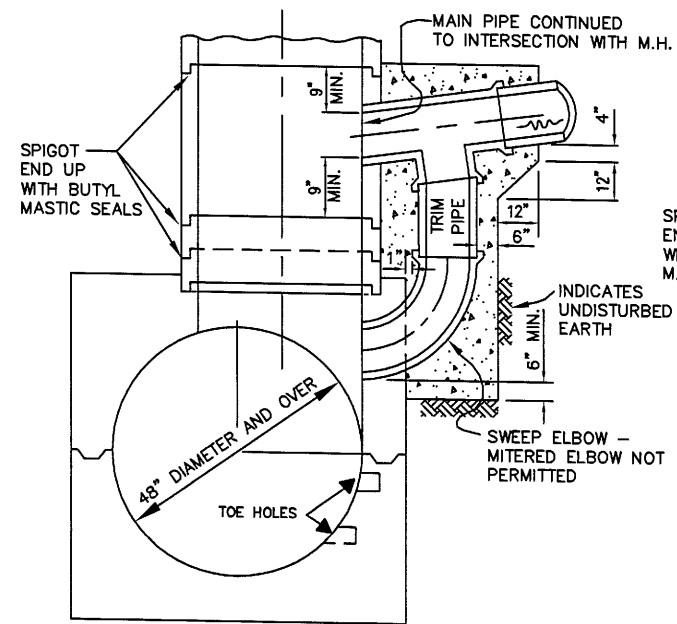
ALL CONCRETE SHALL BE  
CLASS "C".

LIFT HOLES IN MANHOLES SHALL  
BE SEALED WITH HYDRAULIC CEMENT

DROP CONNECTIONS ON SANITARY SEWERS *	
CONDUIT SIZE	STACK SIZE
8"	8"
12"	8" MIN.
15" AND OVER	12" UNLESS OTHERWISE NOTED ON PLANS.

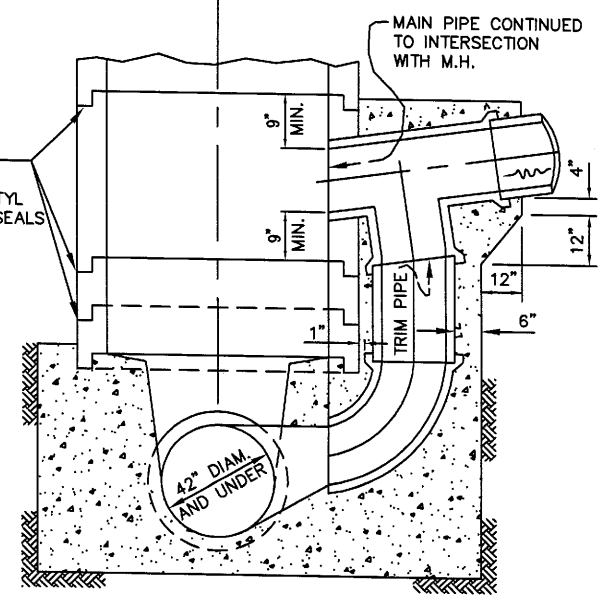
\* ON COMBINED SEWERS, DROP CONNECTION  
TO BE SAME SIZE AS MAIN LINE.

THE  
METROPOLITAN SEWER DISTRICT  
OF  
GREATER CINCINNATI  
**STANDARD  
DROP MANHOLES**



SECTION A-A  
TYPE "D" OR "T"

INDICATES  
UNDISTURBED  
EARTH



SECTION B-B  
TYPE "A", "P" OR "S"

M.C.

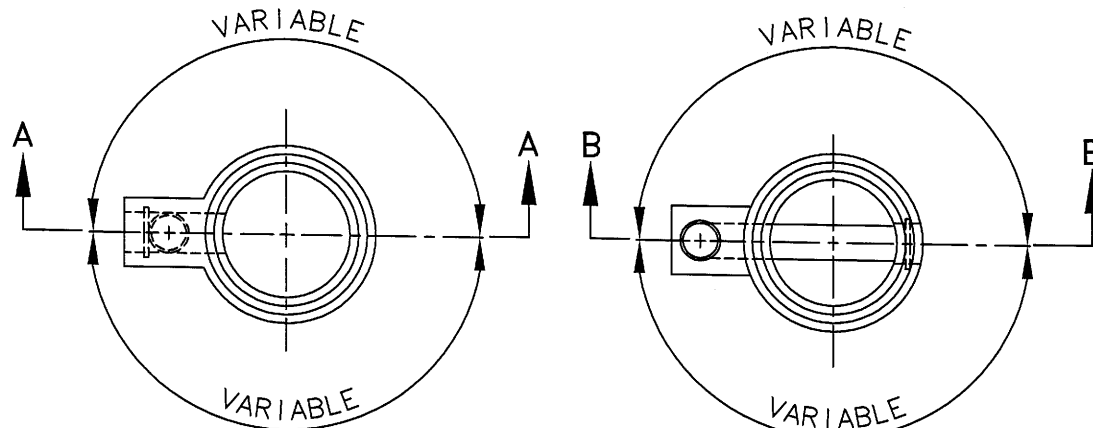
NO SCALE

DATE: DEC. 2010

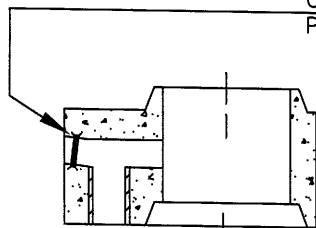
APPROVED:

*Ralph Christ*  
SEWERS CHIEF ENGINEER

ACC. NO. 49003

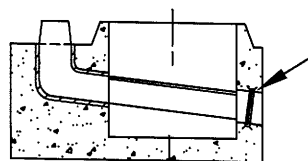


CAST IN @ SKEW OF 15° TO ACCEPT  
PIPE INSTALLED @ GRADE OF 30% ±



SECTION A-A

PRECAST CONCRETE  
DROP BARREL SECTION



SECTION B-B

PRECAST CONCRETE  
DROP BASE SECTION

NOTES:

MANHOLE BASES SHALL BE INSTALLED ON A  
6" MINIMUM GRAVEL BASE (#57 CLEAN WASHED TYPE#1).

THE SEAL BETWEEN PRE-CAST MANHOLE BASE (RISER)  
AND INFLUENT AND/OR EFFLUENT CONDUIT SHALL  
BE A RUBBER GASKET, "A-LOK", "KOR-N-SEAL",  
"DURA-SEAL" OR AN APPROVED EQUAL.

NOTES:

REINFORCEMENT STEEL TO BE AS ACC. NO. 49056.

DROP MANHOLES SHALL ONLY BE USED  
WHERE APPROVED BY M.S.D.

ALL OTHER CHARACTERISTICS ARE SIMILAR  
TO ACC. NO. 49037 OR 49049.

ALL CONCRETE SHALL BE CLASS "C".

LIFT HOLES IN MANHOLES TO BE SEALED WITH  
HYDRAULIC CEMENT.

INTERMEDIATE MANHOLE SECTIONS SHALL BE  
PRECAST SECTIONS WITH THE DROP CAST AS  
PART OF THE SECTION AND COMPATIBLE WITH  
THE PRECAST BARREL AND BASE SECTIONS.

THE GASKET BETWEEN THE PRECAST BASE  
AND RISERS SHALL MEET THE REQUIREMENTS  
OF ASTM C-443 EXCEPT THAT ONLY  
"O" RING AND PROFILE GASKETS ARE ACCEPTABLE.

DROP CONNECTIONS ON SANITARY SEWERS*	
CONDUIT SIZE	STACK SIZE
8"	8"
12"	8" MIN.
15" AND OVER	12" UNLESS OTHERWISE NOTED ON PLANS

\* ON COMBINED SEWERS, DROP CONNECTION  
TO BE SAME SIZE AS MAIN LINE.

THE  
METROPOLITAN SEWER DISTRICT  
OF  
GREATER CINCINNATI  
STANDARD  
PRECAST CONCRETE  
DROP MANHOLE

NO SCALE

DATE: DEC. 2010

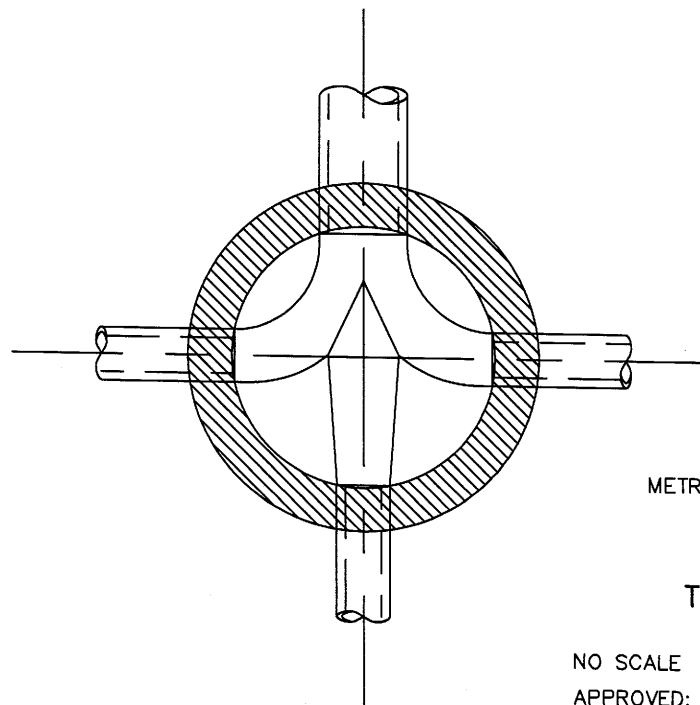
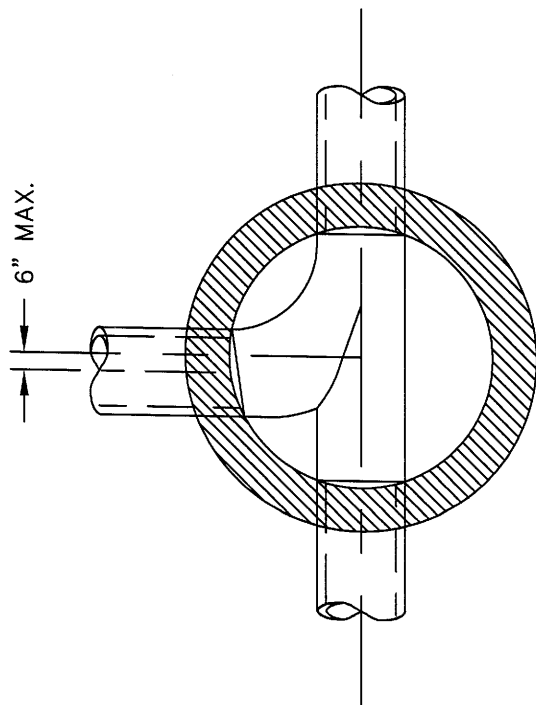
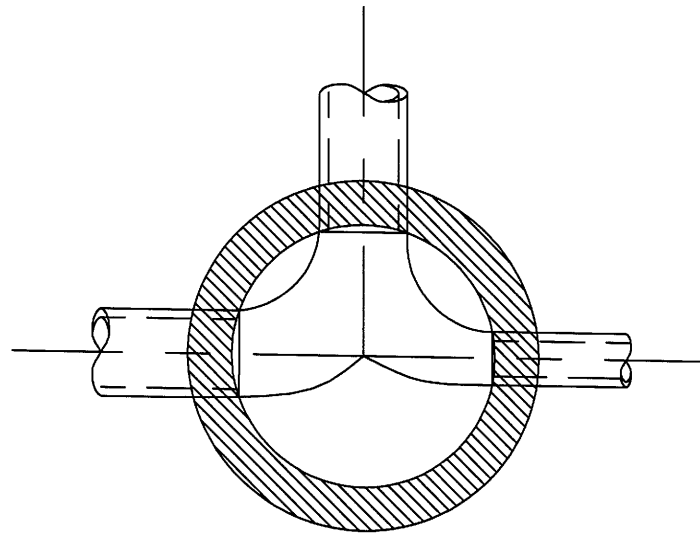
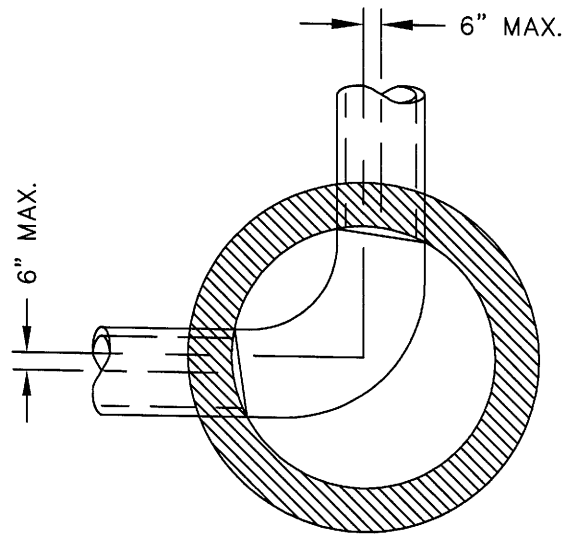
APPROVED:

*Ralph Johnston*  
SEWERS CHIEF ENGINEER

M.C.

(ALTERNATE FOR ACC. NO. 49003)

ACC. NO. 49003-A



T.R.S.

THE  
METROPOLITAN SEWER DISTRICT  
OF  
GREATER CINCINNATI

TYPICAL INVERTS

NO SCALE  
APPROVED:

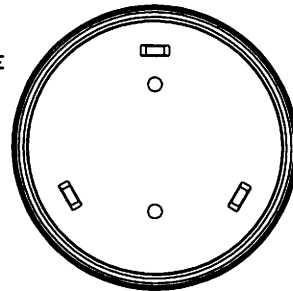
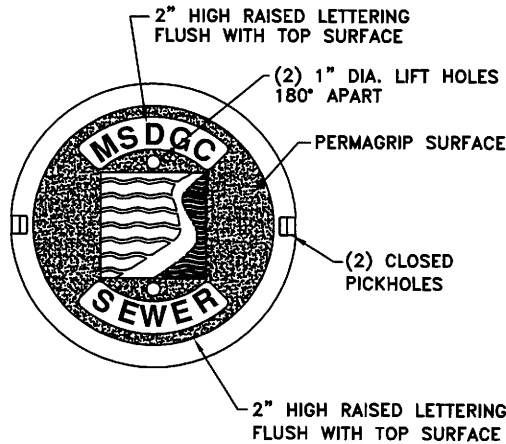
*[Signature]*  
SEWERS CHIEF ENGINEER

DATE: AUG., 2006

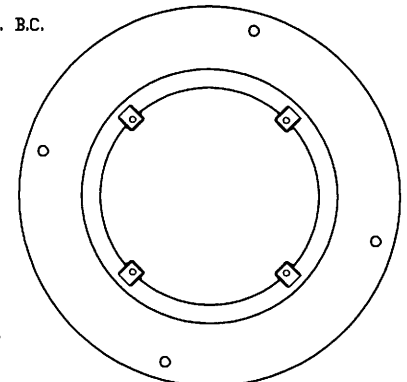
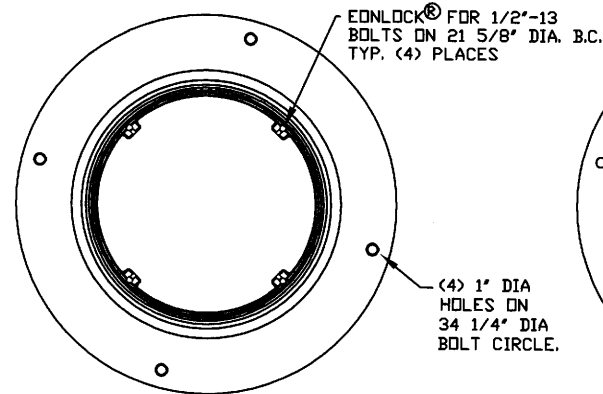
ACC. NO. 49004

LID SPEC: EAST JORDAN PRODUCT #00166565, 1665C OR EQUAL  
 LID MATERIAL: CAST GRAY IRON ASTM A48, CLASS 35B  
 LID FINISH: NO PAINT

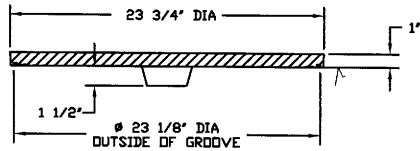
FRAME SPEC: EAST JORDAN PRODUCT #NCR07-2222B, 1665Z1PT, OR EQUAL  
 FRAME MATERIAL: CAST GRAY IRON ASTM A48, CLASS 35B  
 FRAME FINISH: NO PAINT



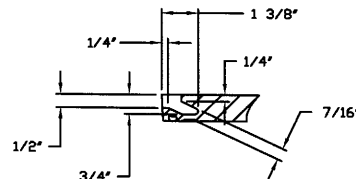
BOTTOM VIEW



BOTTOM VIEW

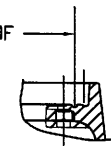


COVER SECTION

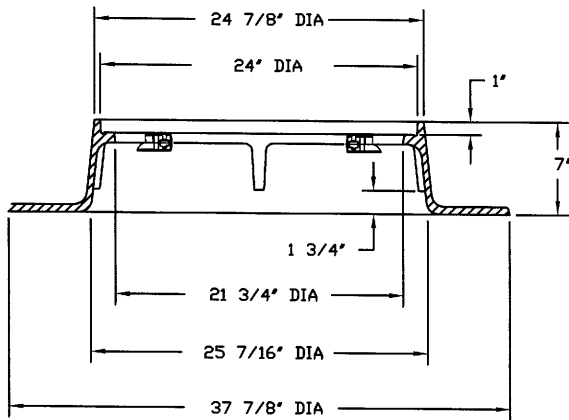


PICKHOLE DETAIL

22 5/8" DIA  
 (TO CENTER LINE OF  
 GASKET GROOVE)



GROOVE & EONLOCK<sup>®</sup>  
 CORE DETAIL



FRAME SECTION

NOTE: NEENAH MAKES AN APPROVED EQUAL TO THIS STANDARD. OTHERS WILL ONLY BE APPROVED IF THE EXACT SAME FUNCTIONALITY AS EONLOCK<sup>®</sup> IS PROVIDED.

THIS FRAME (WITH EONLOCK<sup>®</sup> FUNCTIONALITY) SHALL BE USED ON ALL MANHOLES.

COVER SHOWN ON ACC. NO. 49051 SHALL BE USED WHEN WATERTIGHT LID IS SPECIFIED ON PLANS.

COVER SHOWN ON ACC. NO. 61980 SHALL BE USED ON PRIVATE SANITARY SEWERS.

CASTING SHALL BE SECURED TO MANHOLE CONE SECTION WITH 3/4" DIAMETER STAINLESS STEEL ANCHOR BOLTS OR CINCH ANCHORS. BOLTS OR ANCHORS SHALL BE LONG ENOUGH TO EXTEND THROUGH GRADE RINGS AND AT LEAST 2" INTO MANHOLE CONE SECTION.

THE  
 METROPOLITAN SEWER DISTRICT  
 OF  
 GREATER CINCINNATI  
 STANDARD CASTINGS  
 FOR MANHOLE

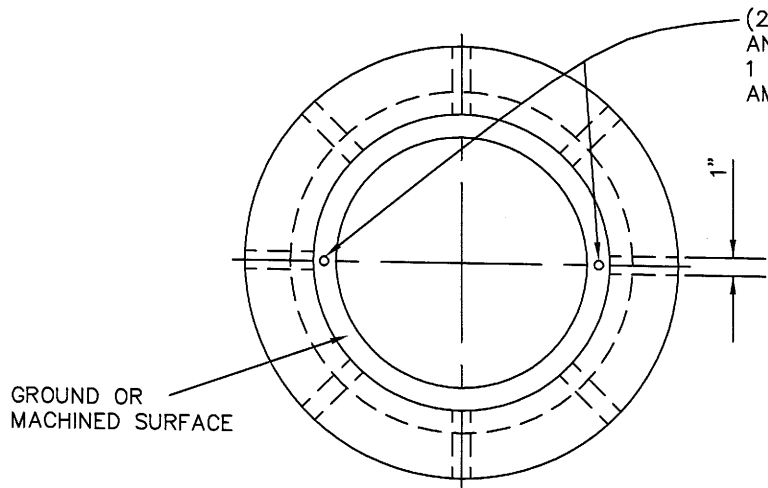
NO SCALE

DATE: AUG. 2011

APPROVED: *Ralph Johnston*  
 SEWERS CHIEF ENGINEER

M.C.

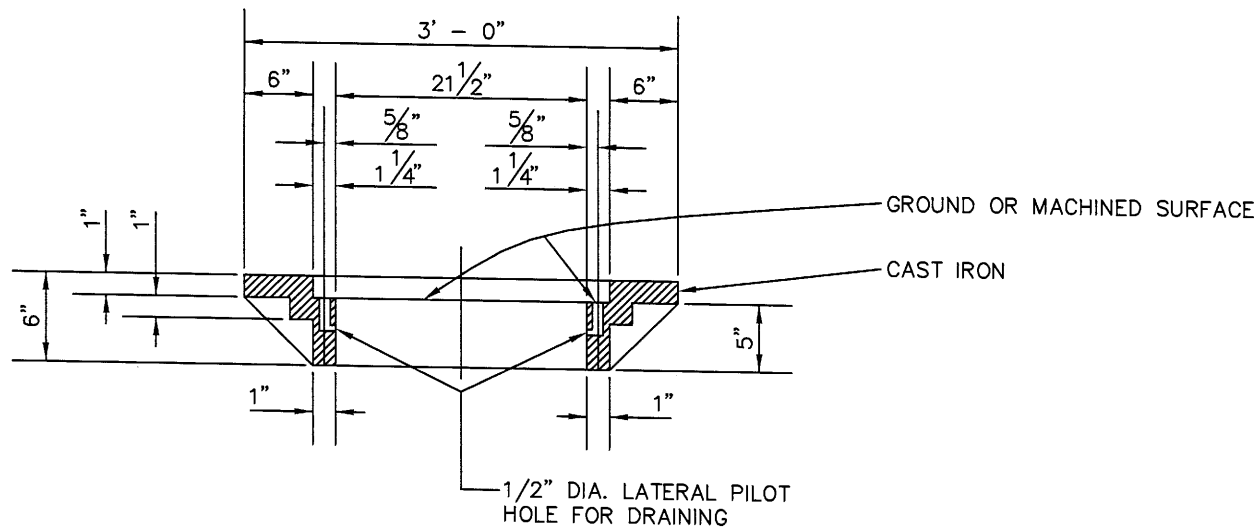
ACC. NO. 49005



**NOTE:**

STANDARD MANHOLE COVER AS SHOWN ON ACC. NO. 49005 SHALL BE SUPPLIED WITH THIS FRAME.

FRAME MATERIAL: CAST GRAY IRON ASTM A48, CLASS 35B  
 FRAME FINISH: NO PAINT

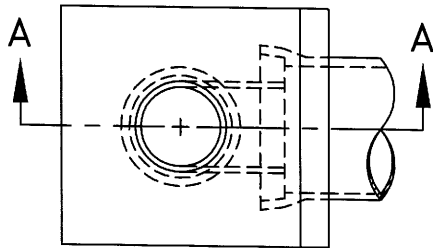


THE  
 METROPOLITAN SEWER DISTRICT  
 OF  
 GREATER CINCINNATI  
**STANDARD CASTING  
 MANHOLE FRAME  
 TYPE "A"**

NO SCALE DATE: DEC. 2010  
 APPROVED: *Ralph Johnston*  
 SEWERS CHIEF ENGINEER

M.C.

ACC. NO. 49006

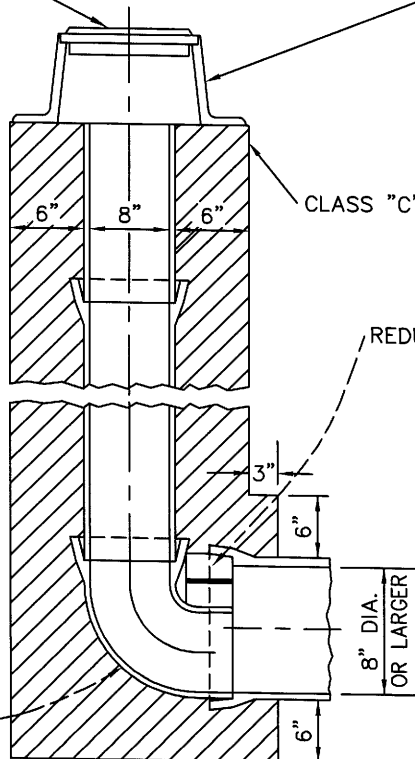


**PLAN**

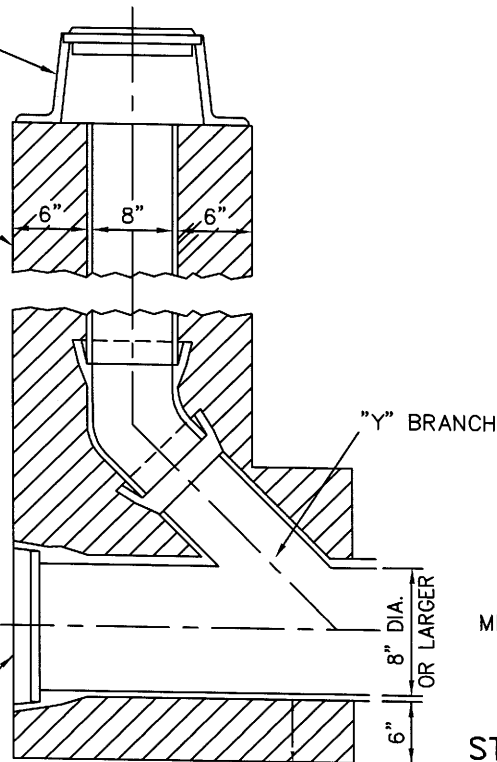
(WITH CASTING REMOVED)

LID SHALL BE LABELED  
MSDGC WITH 3/4" LABELS

LAMP HOLE FRAME AND COVER  
CASTING No.  
EAST JORDAN 1578  
NEENAH R 1976  
OR SATISFACTORY EQUIVALENT



**SECTION A-A**



**ALTERNATE  
SECTION A-A**  
(WHEN SPECIFIED)

THE  
METROPOLITAN SEWER DISTRICT  
OF  
GREATER CINCINNATI

**STANDARD LAMP HOLE**

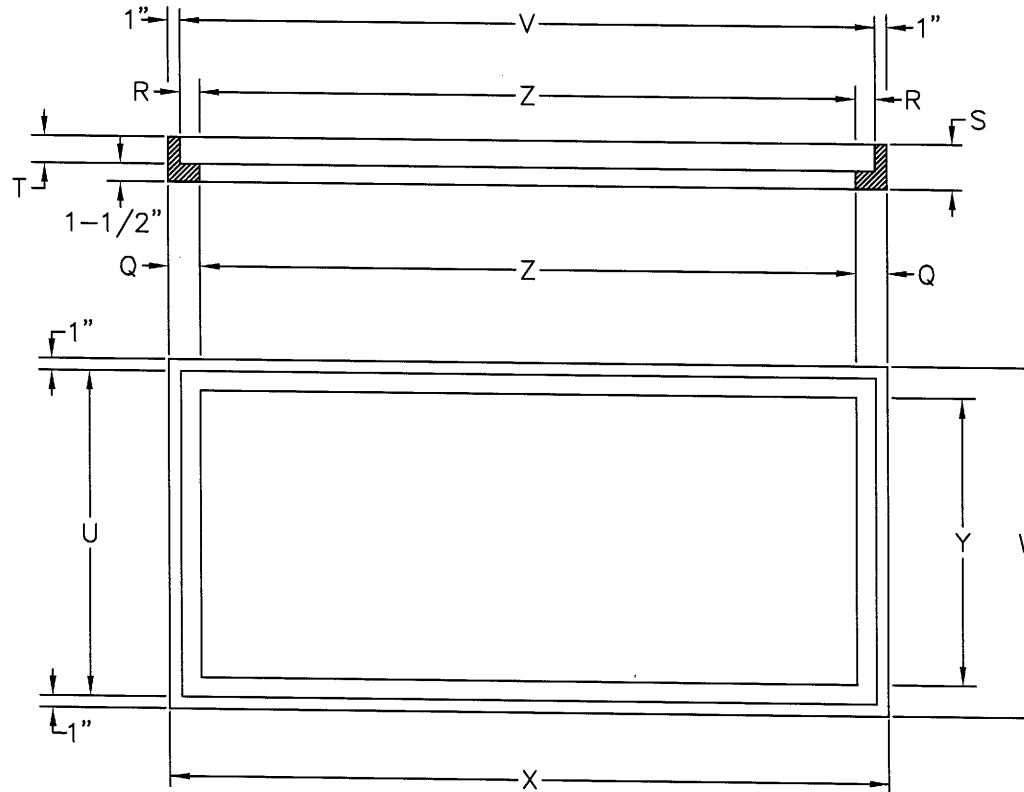
NO SCALE

DATE: JUNE, 2009

APPROVED:

*Thomas P. Schweins*  
SEWERS CHIEF ENGINEER

ACC. NO. 49009



NOTE: FOR MEASUREMENTS, MATERIALS, FINISH, AND INSPECTION, REFER TO PURCHASING SPEC. NO. 11-34, (LATEST EDITION).

NO.	Z	Y	X	W	V	U	T	S	R	Q	COMPUTED WEIGHT IN POUNDS
1	5'-0"	2'-0"	5'-5-1/4"	2'-5-1/4"	5'-3-1/4"	2'-3-1/4"	2-1/4"	3-3/4"	1-5/8"	2-5/8"	290 ±
2	4'-6"	1'-10-1/2"	4'-11-1/4"	2'-3-3/4"	4'-9-1/4"	2'-1-3/4"	2-1/4"	3-3/4"	1-5/8"	2-5/8"	267 ±
3	4'-0"	1'-9"	4'-5"	2'-2"	4'-3"	2'-0"	2"	3-1/2"	1-1/2"	2-1/2"	225 ±
4	3'-6"	1'-7-1/2"	3'-11"	2'-0-1/2"	3'-9"	1'-10-1/2"	2"	3-1/2"	1-1/2"	2-1/2"	202 ±
5	3'-0"	1'-6"	3'-4-3/4"	1'-10-3/4"	3'-2-3/4"	1'-8-3/4"	1-3/4"	3-1/4"	1-3/8"	2-3/8"	165 ±
6	2'-6"	1'-4-1/2"	2'-10-3/4"	1'-9-1/4"	2'-8-3/4"	1'-7-1/4"	1-3/4"	3-1/4"	1-3/8"	2-3/8"	144 ±
7	2'-0"	1'-3"	2'-4-1/2"	1'-7-1/2"	2'-2-1/2"	1'-5-1/2"	1-1/2"	3"	1-1/4"	2-1/4"	112 ±
8	1'-6"	1'-1-1/2"	1'-10-1/2"	1'-6"	1'-8-1/2"	1'-4"	1-1/2"	3"	1-1/4"	2-1/4"	93 ±
9	1'-0"	1'-0"	1'-4-1/2"	1'-4-1/2"	1'-2-1/2"	1'-2-1/2"	1-1/2"	3"	1-1/4"	2-1/4"	74 ±

THE  
METROPOLITAN SEWER DISTRICT  
OF  
GREATER CINCINNATI  
**STANDARD**  
**INTERCEPTOR INLET FRAME**

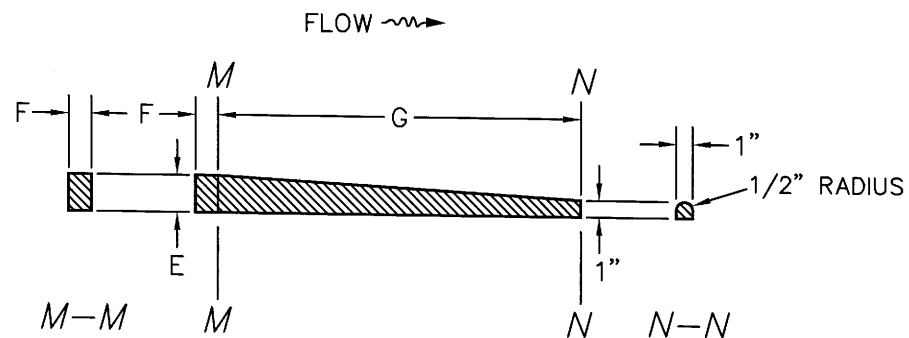
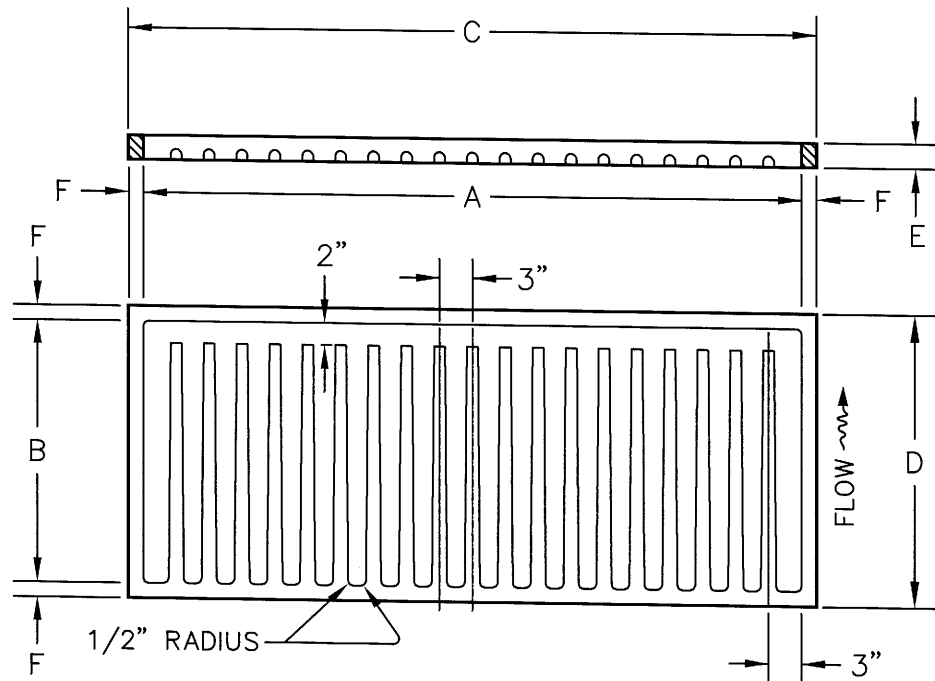
NO SCALE  
APPROVED:

DATE: AUG., 2006

  
SEWERS CHIEF ENGINEER

T.R.S.

ACC. NO. 49026



NO.	A	B	C	D	E	F	G	NUMBER OF BARS	COMPUTED WEIGHT IN POUNDS
1	5'-0"	2'-0"	5'-2-3/4"	2'-2-3/4"	2-1/4"	1-3/8"	1'-10"	19	333 ±
2	4'-6"	1'-10-1/2"	4'-8-3/4"	2'-1-1/4"	2-1/4"	1-3/8"	1'-8-1/2"	17	289 ±
3	4'-0"	1'-9"	4'-2-1/2"	1'-11-1/2"	2"	1-1/4"	1'-7"	15	203 ±
4	3'-6"	1'-7-1/2"	3'-8-1/2"	1'-10"	2"	1-1/4"	1'-5-1/2"	13	171 ±
5	3'-0"	1'-6"	3'-2-1/4"	1'-8-1/4"	1-3/4"	1-1/8"	1'-4"	11	113 ±
6	2'-6"	1'-4-1/2"	2'-8-1/4"	1'-6-3/4"	1-3/4"	1-1/8"	1'-2-1/2"	9	91 ±
7	2'-0"	1'-3"	2'-2"	1'-5"	1-1/2"	1"	1'-1"	7	55 ±
8	1'-6"	1'-1-1/2"	1'-8"	1'-3-1/2"	1-1/2"	1"	11-1/2"	5	41 ±
9	1'-0"	1'-0"	1'-2"	1'-2"	1-1/2"	1"	10"	3	28 ±

**NOTE:** FOR MEASUREMENTS, MATERIALS, FINISH, AND INSPECTION, REFER TO PURCHASING SPEC. NO. 11-34, (LATEST EDITION).

GRATINGS MAY REQUIRE SPECIAL ORDER FROM MANUFACTURER/FOUNDRY

THE  
METROPOLITAN SEWER DISTRICT  
OF  
GREATER CINCINNATI  
**STANDARD INTERCEPTOR  
INLET GRATING**

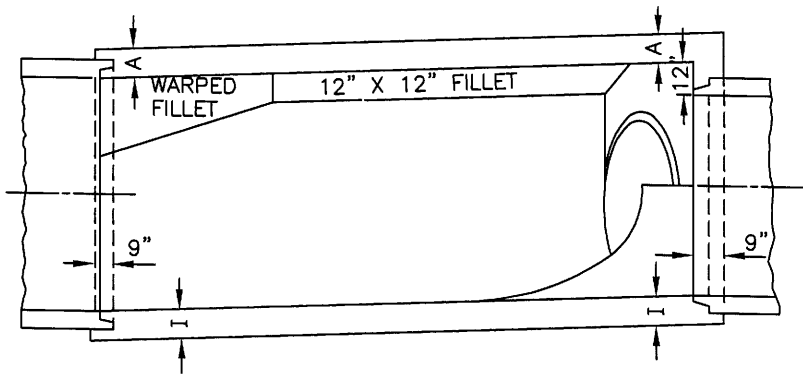
NO SCALE

DATE: JUNE, 2009

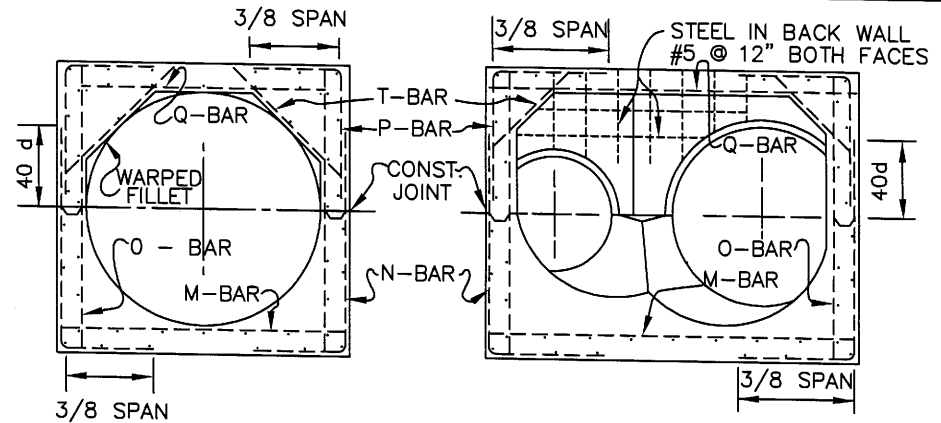
APPROVED: *Thomas H. Schwiers*  
SEWERS CHIEF ENGINEER

T.R.S.

ACC. NO. 49027

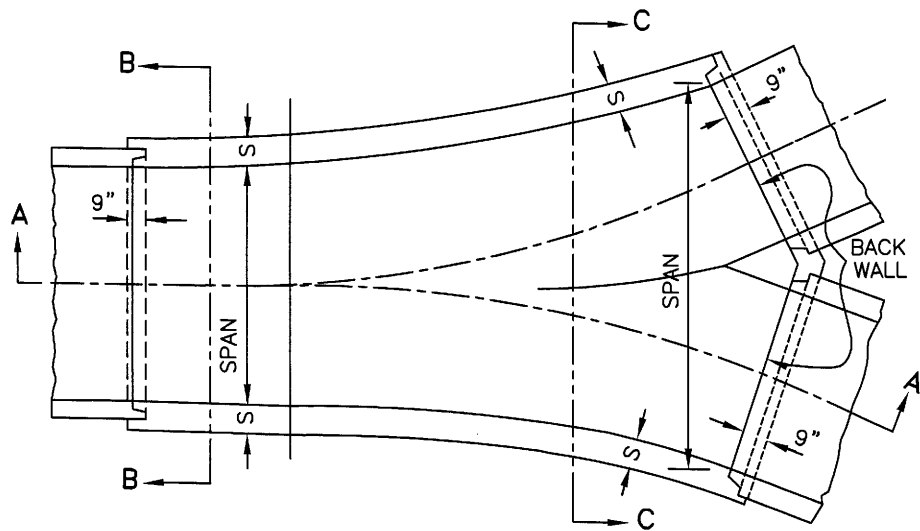


SECTION A-A



SECTION B-B

SECTION C-C



SECTIONAL PLAN

NOTE:

TOP AND BOTTOM SLABS AND SIDE WALLS VARY IN THICKNESS FROM A MINIMUM AT SHORT SPAN TO MAXIMUM AT LONG SPAN WITH DIMENSIONS AS SHOWN IN THE TABLE.

SIZE AND SPACING OF REINFORCING STEEL AS INDICATED IN THE TABLE SHALL BE SELECTED FOR THE RESPECTIVE INCREMENTS OF SPAN, AS DETERMINED FROM THE CONTRACT DRAWINGS OF THE CHAMBER.

STEEL TO HAVE A MINIMUM COVER OF 2 INCHES EXCEPT IN BOTTOM SLAB, WHICH IS TO HAVE A COVER OF 3 INCHES IN EACH FACE.

THIS STANDARD TYPIFIES THE STRUCTURAL DIMENSIONS AND REINFORCING DETAILS FOR A CONCRETE JUNCTION CHAMBER.

THE CHARACTERISTICS OF THE INVERT SHALL BE THE SAME AS INDICATED ON THE CONTRACT DRAWING FOR THE JUNCTION CHAMBER.

CONCRETE SHALL BE CLASS "C"

SPAN	CONC. DIMENSIONS			REINFORCING BARS & SPACING					
	A	I	S	M	N	O	P	Q	T
4.0'to 7.0'	10"	12"	10"	#7@10"	#6@10"	#5@20"	#6@10"	#7@10"	#5@20"
7.0'to 10.0'	12"	14"	10"	#7@8"	#6@8"	#5@16"	#6@8"	#7@8"	#5@16"
10.0'to 13.0'	15"	18"	12"	#7@6"	#6@6"	#5@12"	#6@6"	#7@6"	#5@12"
13.0'to 16.0'	18"	21"	15"	#8@6"	#6@6"	#5@12"	#6@6"	#8@6"	#5@12"
				LONG BARS #5 ± @ 15" ± ALL SECTIONS					

THE  
METROPOLITAN SEWER DISTRICT  
OF  
GREATER CINCINNATI  
**STRUCTURAL DIMENSIONS AND  
STEEL DETAILS FOR REINFORCED  
CONCRETE JUNCTION CHAMBERS**

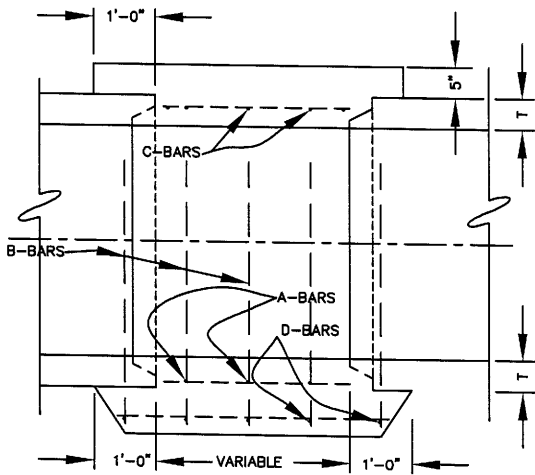
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DATE: AUG., 2006

APPROVED:

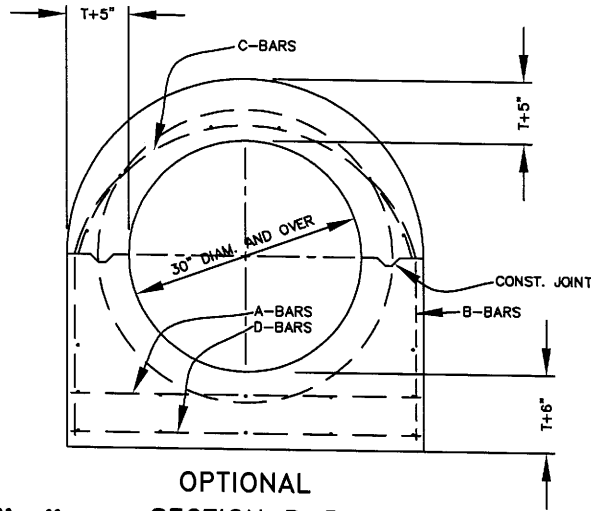
SEWERS CHIEF ENGINEER

ACC. NO. 49029

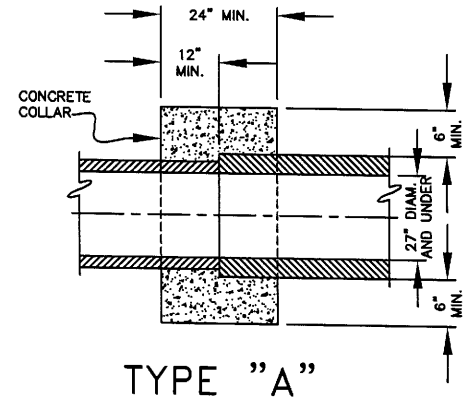


SECTION A-A

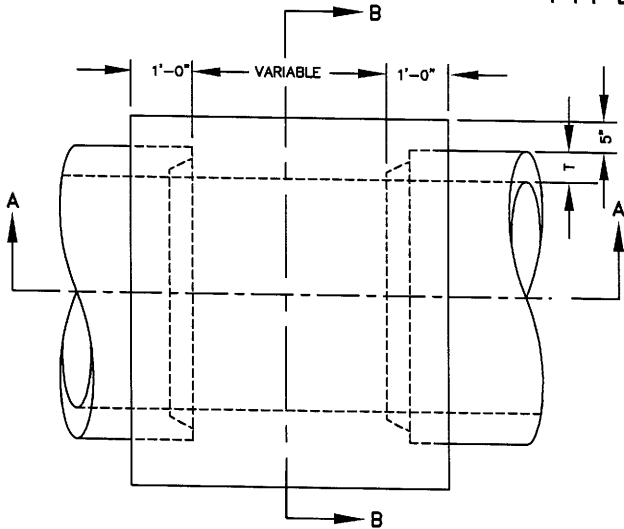
TYPE "B"



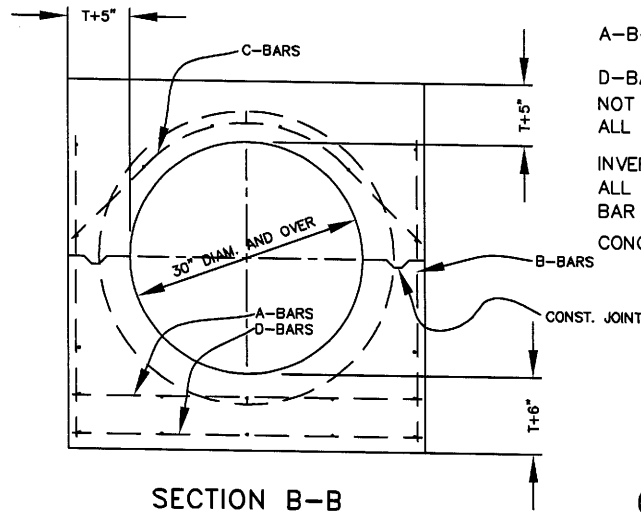
OPTIONAL SECTION B-B



TYPE "A"



PLAN



SECTION B-B

NOTE:

- A-B-C AND D-BARS @ 12" O.C.
- A-B-C { #5 BARS FOR 30" TO 60" SEWERS.
- #6 BARS FOR 66" TO 78" SEWERS.
- #7 BARS FOR 84" TO 108" SEWERS.
- D-BARS #5 BARS FOR 30" TO 108" SEWERS.
- NOT LESS THAN 3 TRANSVERSE BARS IN ANY GAP.
- ALL LONGITUDINAL STEEL - #5 BARS @ 18" O.C.
- INVERT STEEL - 3" CL.
- ALL OTHER STEEL - 2" CL.
- BAR LAP - 30 TIMES THE BAR DIAMETER.
- CONCRETE SHALL BE CLASS "C".

THE  
METROPOLITAN SEWER DISTRICT  
OF  
GREATER CINCINNATI  
STANDARD  
CONCRETE COLLARS  
ON CONDUITS

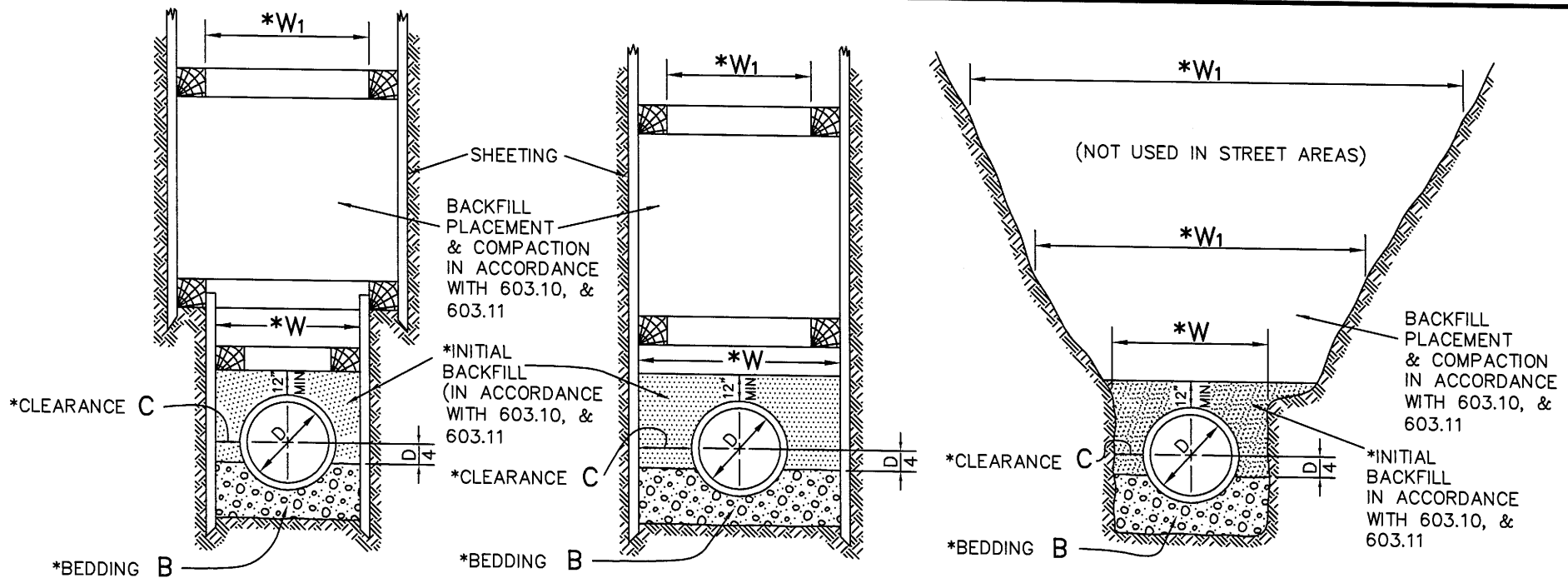
NO SCALE

DATE: AUG., 2006

APPROVED:

SEWERS CHIEF ENGINEER

ACC. NO. 49031



**NOTE:** ALL TRENCHES SHALL BE IN ACCORDANCE WITH OSHA STANDARDS (LATEST EDITION).

**W** SHALL NOT EXCEED 39 INCHES FOR 8 TO 21 INCH DIAMETER CONDUITS, OR THE GREATEST OUTSIDE DIAMETER PLUS 4 TIMES THE SHELL THICKNESS FOR CONDUITS 24 INCH DIAMETER AND OVER.

**C** SHALL BE NOT LESS THAN 6 INCHES AT THE POINT OF GREATEST OUTSIDE DIAMETER ON CONDUITS UP TO AND INCLUDING 60 INCH DIAMETER. SHALL BE NOT LESS THAN ONE SHELL THICKNESS AT THE POINT OF GREATEST OUTSIDE DIAMETER ON 66 INCH DIAMETER AND OVER.

**W1** MAY BE EQUAL TO **W**, OR CAN BE MODIFIED AS GOVERNED BY SURFACE OR SUB-SURFACE CONDITIONS.

**B** CLASS OF MATERIAL AND DEPTH OF BEDDING UNDER CONDUIT:  
 6 INCHES OF BANK RUN GRAVEL WITH NOT MORE THAN 5% CLAY OR SILT BY WEIGHT AND FREE FROM AN EXCESSIVE AMOUNT OF DELETERIOUS MATERIAL WITH THE FOLLOWING GRADATION:  
 100% PASSING A 1-INCH SIEVE; NOT MORE THAN 25% PASSING A 1/4-INCH SIEVE;  
 AND NOT MORE THAN 5% PASSING A NO. 50 SIEVE, FOR CONDUITS 6 TO 24 INCHES IN DIAMETER.  
 6 INCHES OF NO. 57 CLEAN WASHED GRAVEL WITH 100% PASSING A 1-INCH SIEVE FOR CONDUIT 27 TO 60 INCHES IN DIAMETER.  
 8 INCHES OF NO. 2 GRAVEL FOR CONDUIT LARGER THAN 60 INCHES IN DIAMETER.

\* PLASTIC PIPE SHALL BE INSTALLED IN FULL COMPLIANCE WITH ASTM D-2321, LATEST EDITION, EXCEPT AS MODIFIED BY 603.018 AND FURTHER MODIFIED THAT ALL BEDDING SHALL PASS A 1-INCH SIEVE. CLASS I AND CLASS II BEDDING AND INITIAL BACKFILL SHALL BE USED AS FOLLOWS:

CLASS I MATERIAL SHALL BE USED WHEN THE DEPTH OF COVER ON THE CONDUIT IS BETWEEN 14 FEET AND 35 FEET.

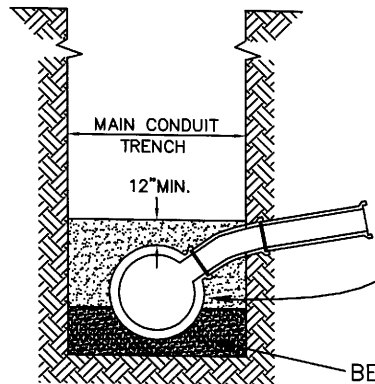
CLASS II MATERIAL SHALL BE USED WHEN THE DEPTH OF COVER ON THE CONDUIT IS 14 FEET OR LESS.

THE  
 METROPOLITAN SEWER DISTRICT  
 OF  
 GREATER CINCINNATI  
**CONTROL DIMENSIONS FOR  
 TYPICAL TRENCHES  
 FOR CONDUITS**

NO SCALE DATE: DEC. 2010  
 APPROVED: *Ralph [Signature]*  
 SEWERS CHIEF ENGINEER

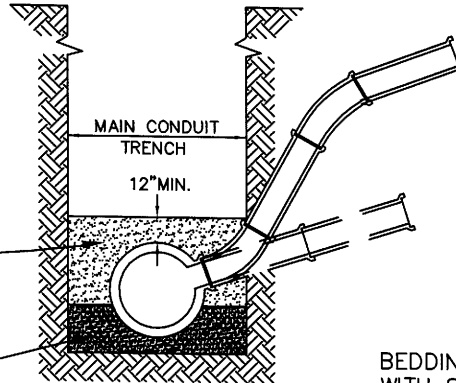
M.C.

ACC. NO. 49032



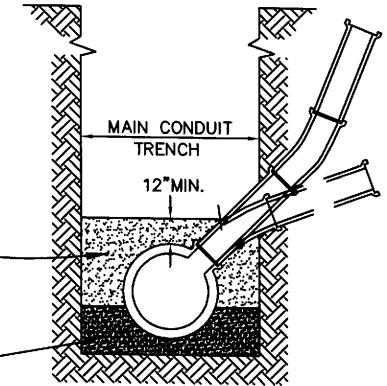
BACKFILL IN ACCORDANCE WITH 603.10

BEDDING IN ACCORDANCE WITH STANDARD DRAWING ACC. NO. 49032

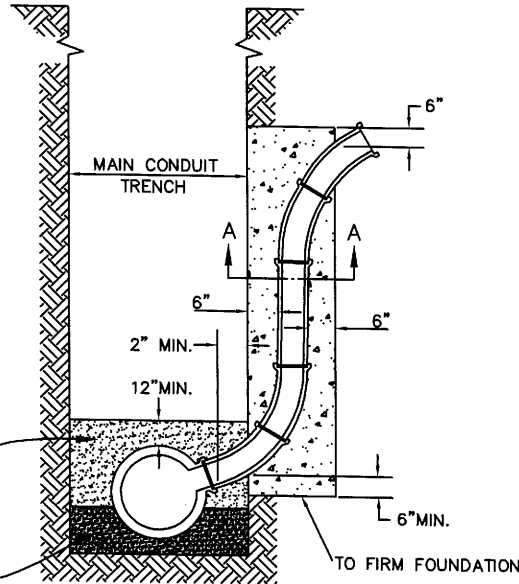
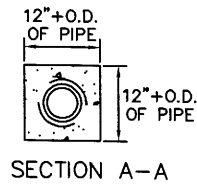


BACKFILL IN ACCORDANCE WITH 603.10

BEDDING IN ACCORDANCE WITH STANDARD DRAWING ACC. NO. 49032



BACKFILL IN ACCORDANCE WITH 603.10



BACKFILL IN ACCORDANCE WITH 603.10

BEDDING IN ACCORDANCE WITH STANDARD DRAWING ACC. NO. 49032

TO FIRM FOUNDATION

**NOTE:**

STACKS SHALL BE BUILT OF CONCRETE LAID UP IN 1:2 PORTLAND CEMENT MORTAR, OR ALTERNATIVE CONSTRUCTION OF 6" OF CLASS "E" CONCRETE.

ALL BENDS SHALL BE 30°, OR 22 1/2° FOR PVC PIPE, AS NOTED.

SEE ACC. NO. 49060 FOR INSTALLATION OF BUILDING SEWER LATERAL.

THE  
METROPOLITAN SEWER DISTRICT  
OF  
GREATER CINCINNATI

**TYPICAL  
BUILDING SEWERS AND STACKS**

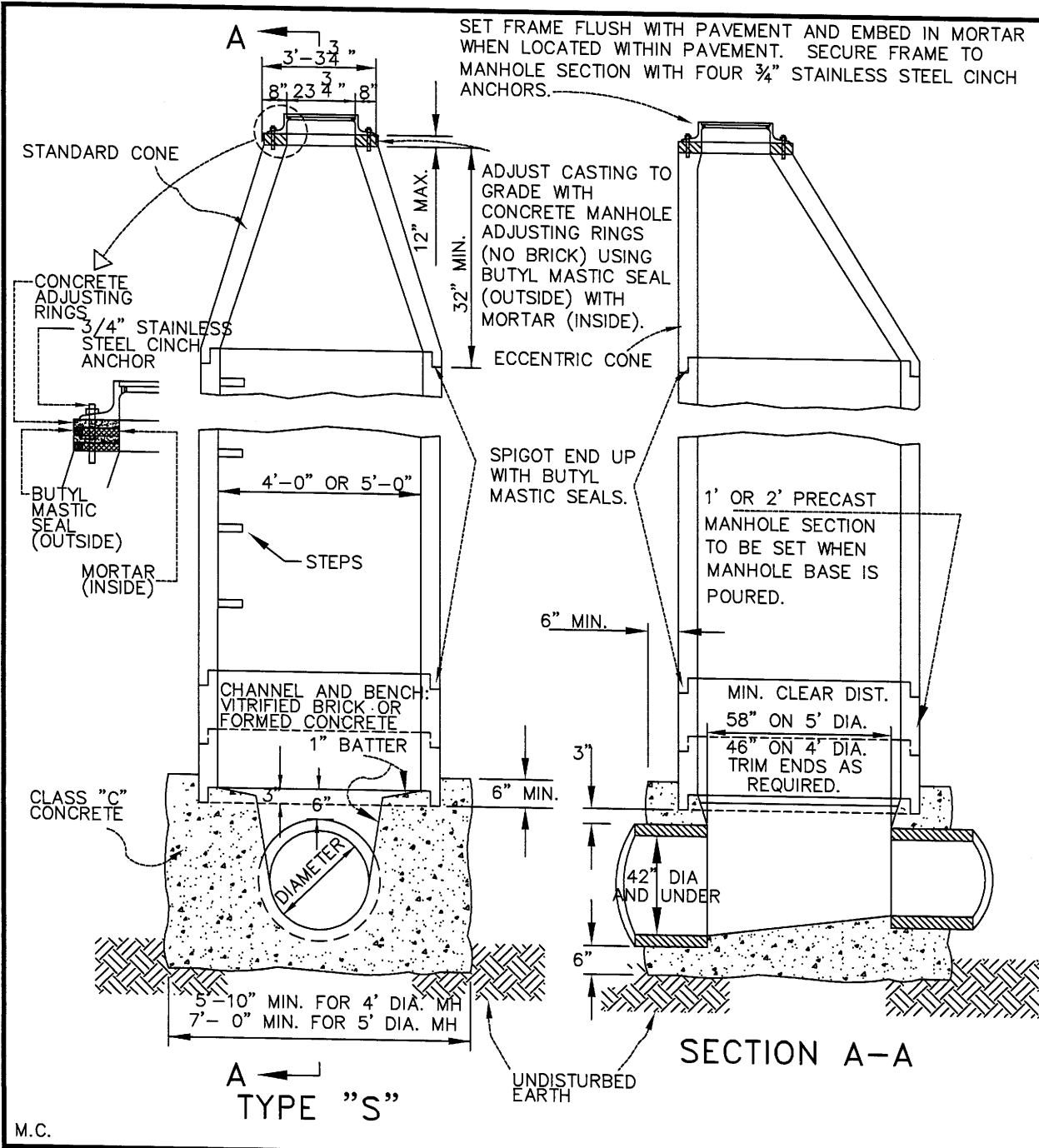
NO SCALE

DATE: JUNE, 2009

APPROVED: *Thomas Schwies*  
SEWERS CHIEF ENGINEER

M.C.

ACC. NO. 49033



SET FRAME FLUSH WITH PAVEMENT AND EMBED IN MORTAR WHEN LOCATED WITHIN PAVEMENT. SECURE FRAME TO MANHOLE SECTION WITH FOUR 3/4" STAINLESS STEEL CINCH ANCHORS.

NOTES:

5' DIAMETER MANHOLE SHALL BE CONSTRUCTED OF 60" PRECAST MANHOLE SECTIONS. A 5' TO 4' REDUCER MAY BE USED ABOVE THE BASE SECTION.

3' ECCENTRIC CONE MAY BE USED ONLY WHERE PERMISSION IS GRANTED BY THE CITY.

PRECAST CONCRETE BARRELS AND CONES SHALL MEET THE REQUIREMENTS OF 706.13 OF THE SPECIFICATIONS.

JOINTS ON MANHOLE SECTIONS SHALL BE MADE WITH A RUBBER GASKET MEETING THE REQUIREMENTS OF ASTM C-443, EXCEPT THAT ONLY "O" RING AND PROFILE GASKETS ARE ACCEPTABLE.

LIFT HOLES IN MANHOLES TO BE SEALED WITH HYDRAULIC CEMENT.

MANHOLE FRAME AND COVER CASTINGS SHALL BE IN ACCORDANCE WITH STD. ACC. NO. 49005

THE STANDARD PRECAST MANHOLE BASE, ACC. NO. 49056, MAY BE USED AS AN ALTERNATE TO THIS STANDARD WHERE APPLICABLE.

USE MANHOLE ACC. NO. 49049 FOR CONDUITS 24" TO 42" IN DIAMETER WHEN NOT LOCATED WITHIN PAVED AREAS.

STEPS CONSTRUCTED OF RUBBER COATED CAST IRON, STAINLESS STEEL, OR FIBER REINFORCED PLASTIC SHALL BE PROVIDED ON ALL MANHOLES.

A MIN. 12" WIDTH EXTERIOR SEALANT WRAP, SUCH AS "WRAPIDSEAL" OR APPROVED EQUAL, SHALL BE PROVIDED AROUND JOINTS AND CASTING IN HIGH WATER TABLES, WHEN SPECIFIED ON PLANS.

THE METROPOLITAN SEWER DISTRICT  
OF GREATER CINCINNATI  
**STANDARD MANHOLE  
ON SANITARY CONDUITS  
42" AND UNDER**

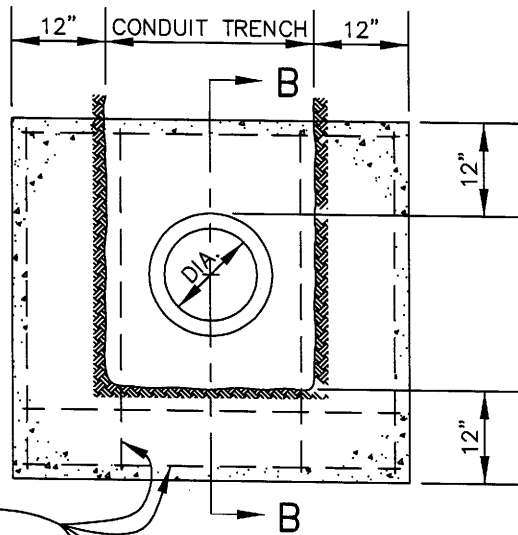
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DATE: DEC. 2010

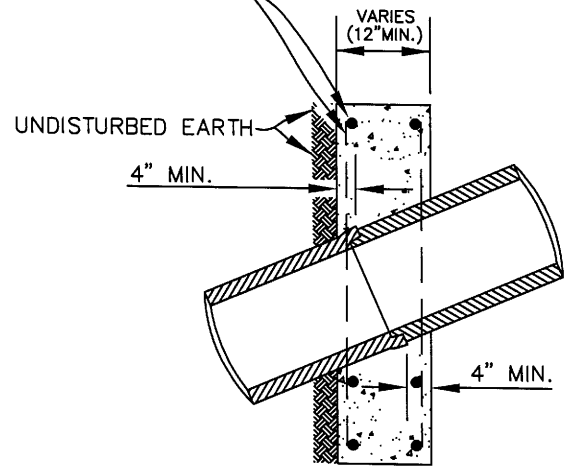
APPROVED: *Ralph J. Hunter*  
SEWERS CHIEF ENGINEER

ACC. NO. 49037

M.C.



ALL BARS SHALL BE #4  
WITH MIN. 2" COVER.



SECTION B-B

NOTE:  
CONCRETE SHALL BE CLASS "C"

THE  
METROPOLITAN SEWER DISTRICT  
OF  
GREATER CINCINNATI  
**STANDARD  
KEY BLOCK**

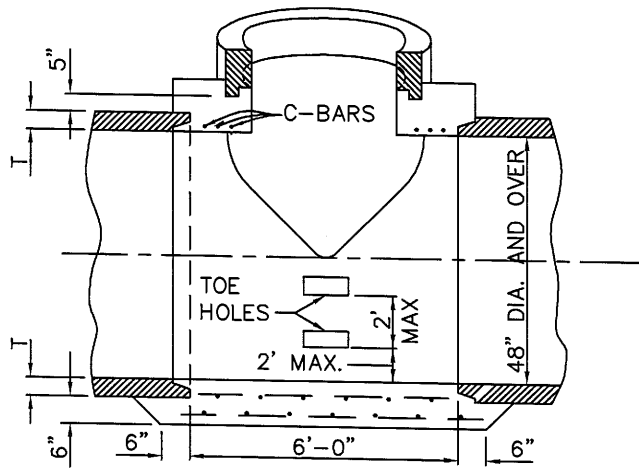
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APPROVED:

*[Signature]*  
SEWERS CHIEF ENGINEER  
DATE: AUG., 2006

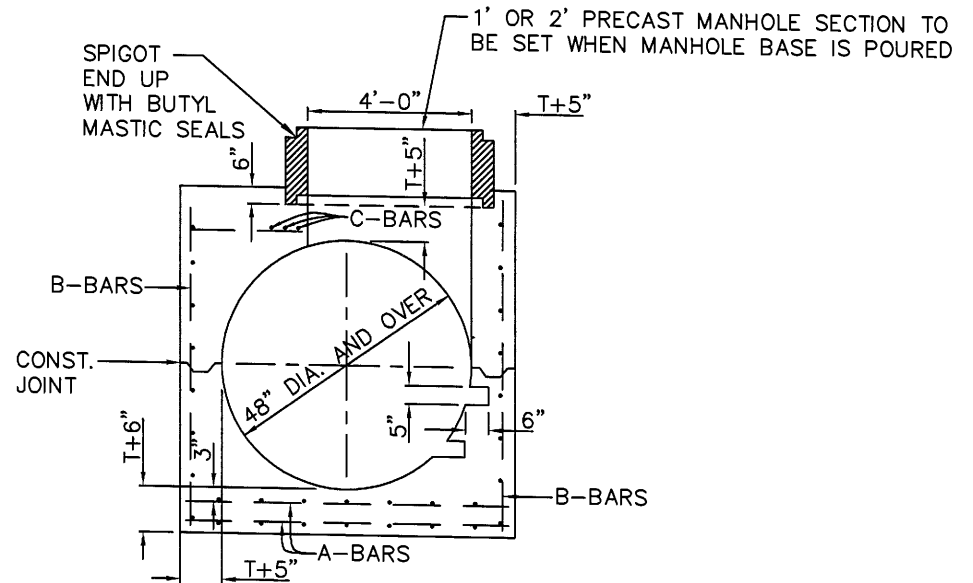
S.N.

ACC. NO. 49039

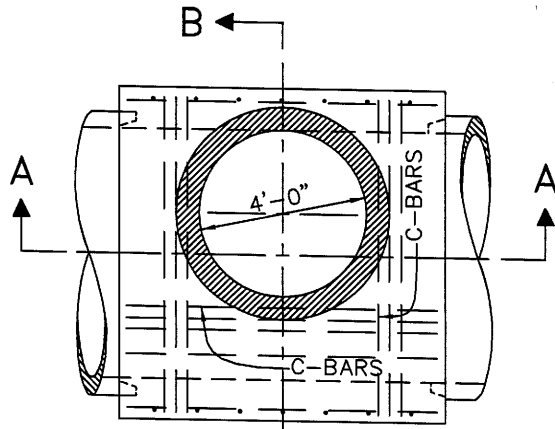
USE SAME BARREL AND CONCENTRIC CONE AS SHOWN ON ACC. NO. 49037 WHEN LOCATED IN PAVED AREAS. WHEN LOCATED OUTSIDE OF PAVED AREAS, PROVIDE FLATTOP SLAB PER ACC. NO. 49048.



SECTION A-A



SECTION B-B



PLAN

NOTES:

MANHOLE BASE IS SHOWN FOR SEWERS WITH NO HORIZONTAL DEFLECTION. BASE WILL NEED TO BE ENLARGED AND DESIGNED FOR SEWERS WITH HORIZONTAL DEFLECTIONS. 5' DIAMETER BARREL SHALL BE PROVIDED ON CONDUITS 60" AND LARGER. SHOP DRAWINGS SIGNED AND SEALED BY A PROFESSIONAL ENGINEER SHALL BE PROVIDED TO MSD.

ALL CONCRETE SHALL BE CLASS "C".

ALL STEEL SHALL HAVE 2" COVER EXCEPT WHERE NOTED.

LONGITUDINAL STEEL - NO. 5 BARS @ 18" O.C.

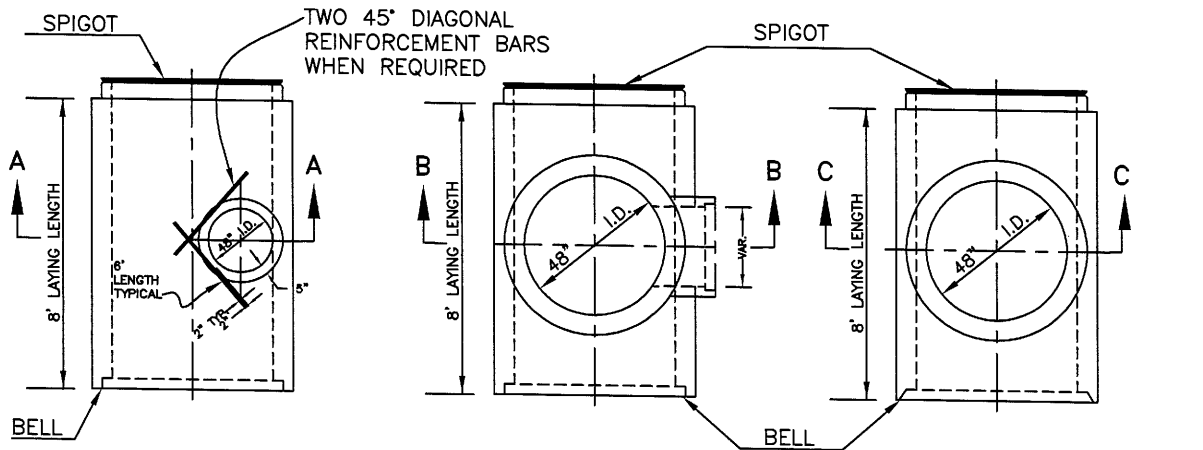
A AND B BARS - 12" O.C. AS SHOWN.

C BARS - 3" O.C. AS SHOWN.

A, B AND C BARS - NO. 5 BARS ON 48" TO 60" SEW.  
 NO. 6 BARS ON 66" TO 78" SEW.  
 NO. 7 BARS ON 84" TO 108" SEW.

THE  
 METROPOLITAN SEWER DISTRICT  
 OF  
 GREATER CINCINNATI  
**STANDARD MANHOLE  
 ON SAN. CONDUITS  
 48" AND OVER**

NO SCALE DATE: DEC. 2010  
 APPROVED: *Ralph J. Hunt*  
 SEWERS CHIEF ENGINEER



**NOTES:**

USE SAME BARREL AND CONCENTRIC CONE AS SHOWN ON ACC. NO. 49037 WHEN LOCATED IN PAVED AREAS. WHEN LOCATED OUTSIDE OF PAVED AREAS, PROVIDE BARREL AND FLATTOP SLAB AS SHOWN ON ACC. NO. 49048.

5' DIAMETER BARREL SHALL BE USED ON CONDUITS 60" AND LARGER.

THE PRECAST MANHOLE TEE SHALL MEET THE SAME STRENGTH CLASS AS THE MAINLINE PIPE.

PRECAST MANHOLE TEES MAY BE USED ON CONDUITS 48" AND OVER UNLESS OTHERWISE NOTED ON THE PLANS.

REINFORCEMENT STEEL SHALL BE IN ACCORDANCE WITH ASTM C-478.

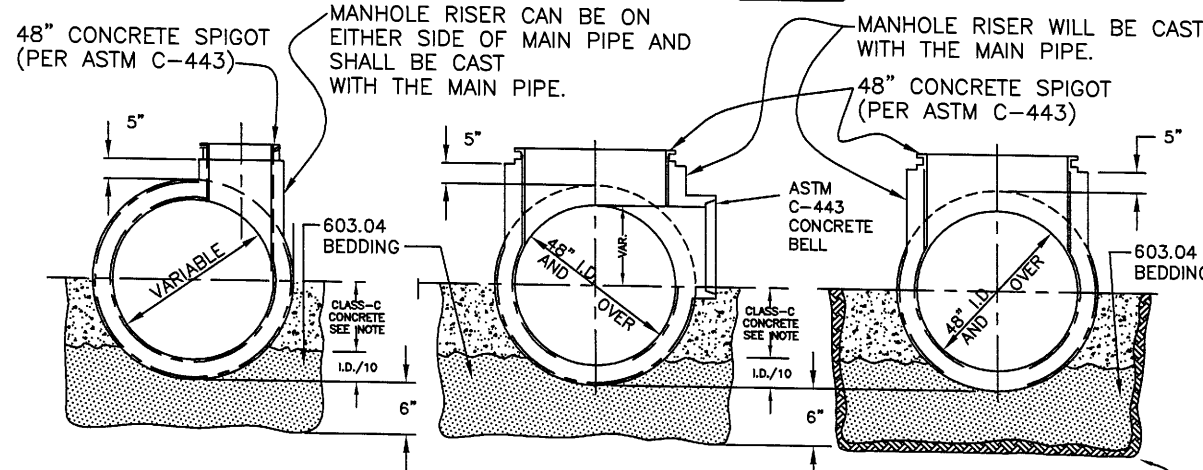
ALL CONCRETE SHALL BE CLASS "C".

THE GASKET BETWEEN THE PRECAST MANHOLE BASE RISERS SHALL MEET THE REQUIREMENTS OF ASTM C-443, EXCEPT THAT ONLY "O" RING AND PROFILE GASKETS ARE ACCEPTABLE.

OPENINGS FOR INFLUENT AND EFFLUENT CONDUIT SHALL BE PROVIDED TO MEET THE PROJECT REQUIREMENT.

ALL LIFT HOLES SHALL BE SEALED WITH HYDRAULIC CEMENT.

ALL CHARACTERISTICS NOT SHOWN HEREON SHALL BE SIMILAR TO ACC. NO. 49037.



SECTION A-A

SECTION B-B

SECTION C-C

UNDISTURBED EARTH (TYPICAL)

PRECAST MANHOLE TEE WITH OFFSET MANHOLE RISER

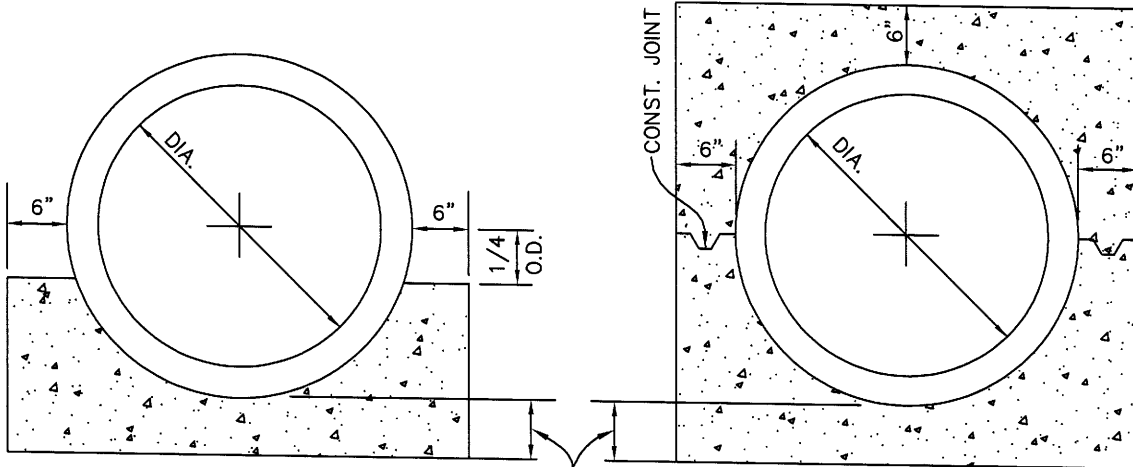
PRECAST MANHOLE TEE WITH INCOMING LINE

PRECAST MANHOLE TEE WITHOUT INCOMING LINE

NOTE: PRECAST MANHOLE TEE SHALL BE INSTALLED ON A 6" MINIMUM GRAVEL BASE (#57 CLEAN WASHED TYPE 1) AS SHOWN. CLASS "C" CONCRETE SHALL BE INSTALLED AROUND MANHOLE BASE UP TO THE SPRING LINE AS SHOWN WHEN DEPTH OF MANHOLE EXCEEDS 20 FEET.

THE METROPOLITAN SEWER DISTRICT OF GREATER CINCINNATI  
**PRECAST MANHOLE TEE**  
 ALTERNATE FOR TYPE "T" STANDARD  
 MANHOLE ON SANITARY CONDUITS 48" AND OVER

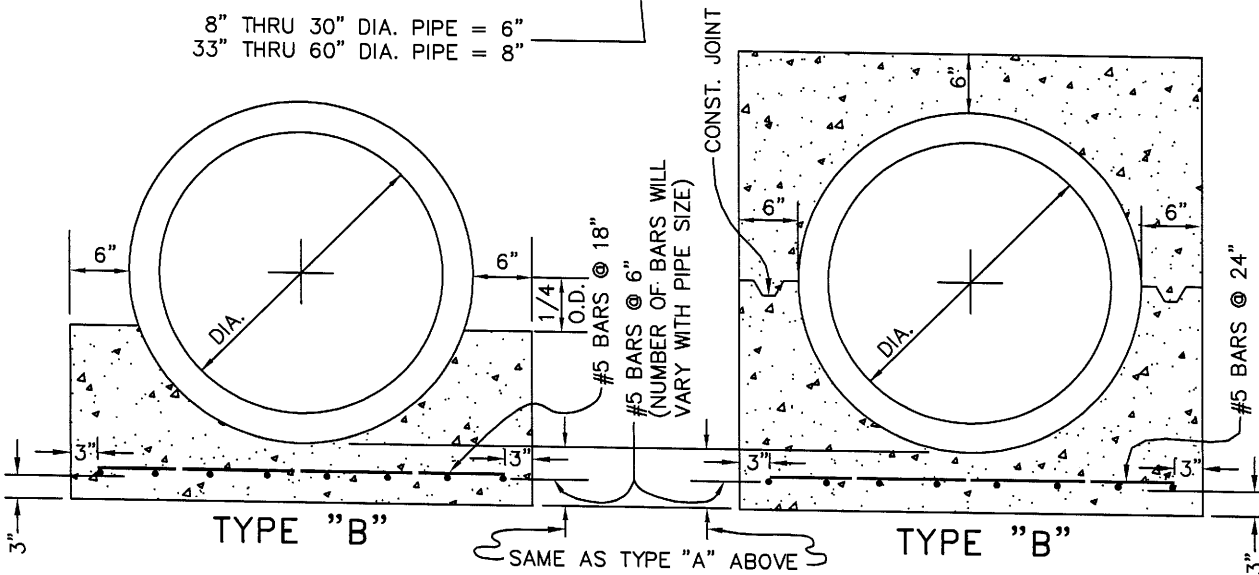
NO SCALE DATE: DEC. 2010  
 APPROVED: *Ralph Johnston*  
 SEWERS CHIEF ENGINEER



TYPE "A"

TYPE "A"

8" THRU 30" DIA. PIPE = 6"  
 33" THRU 60" DIA. PIPE = 8"



TYPE "B"

TYPE "B"

SAME AS TYPE "A" ABOVE

CRADLE

ENCASEMENT

PIPE SIZE IN.	CRADLE CU. YDS. /L.F.	ENCASEMENT CU. YDS. /L.F.
8	.0398	.1079
10	.0493	.1266
12	.0619	.1500
15	.0734	.1787
18	.0852	.2085
21	.0922	.2343
24	.1103	.2719
27	.1239	.3058
30	.1381	.3410
33	.1800	.4046
36	.1972	.4443
42	.2335	.5278
48	.2727	.6167
54	.3134	.7111
60	.3570	.8108

QUANTITY TABULATION

THESE QUANTITIES SHALL BE USED TO  
 DETERMINE THE PAY QUANTITY FOR 602.

NOTE:

CONCRETE SHALL BE CLASS "C"

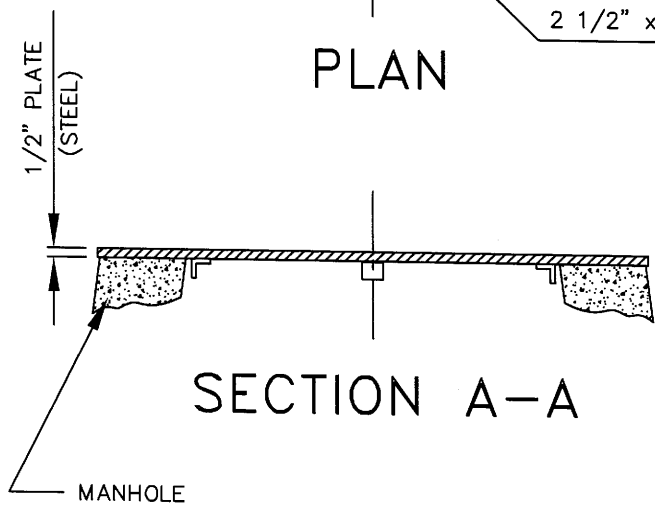
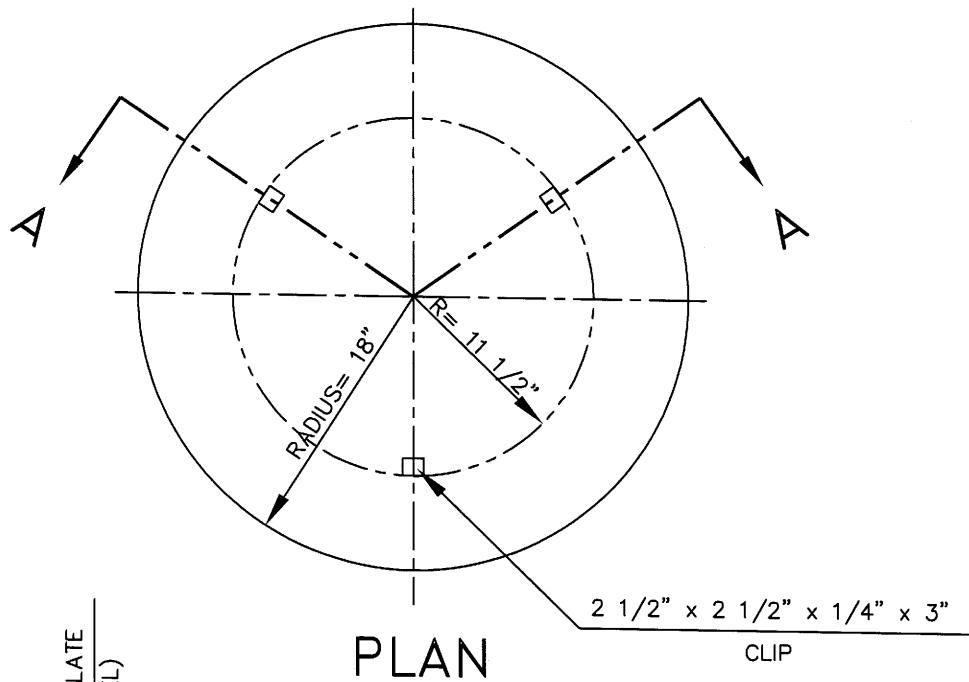
THE  
 METROPOLITAN SEWER DISTRICT  
 OF  
 GREATER CINCINNATI  
**STANDARD**  
**CONC. CRADLE AND**  
**ENCASEMENT**

NO SCALE  
 APPROVED:

DATE: AUG., 2006

SEWERS CHIEF ENGINEER

ACC. NO. 49044



NOTE  
CLIPS SHALL BE WELDED TO COVER

THE  
METROPOLITAN SEWER DISTRICT  
OF  
GREATER CINCINNATI  
STANDARD TEMPORARY  
MANHOLE COVER

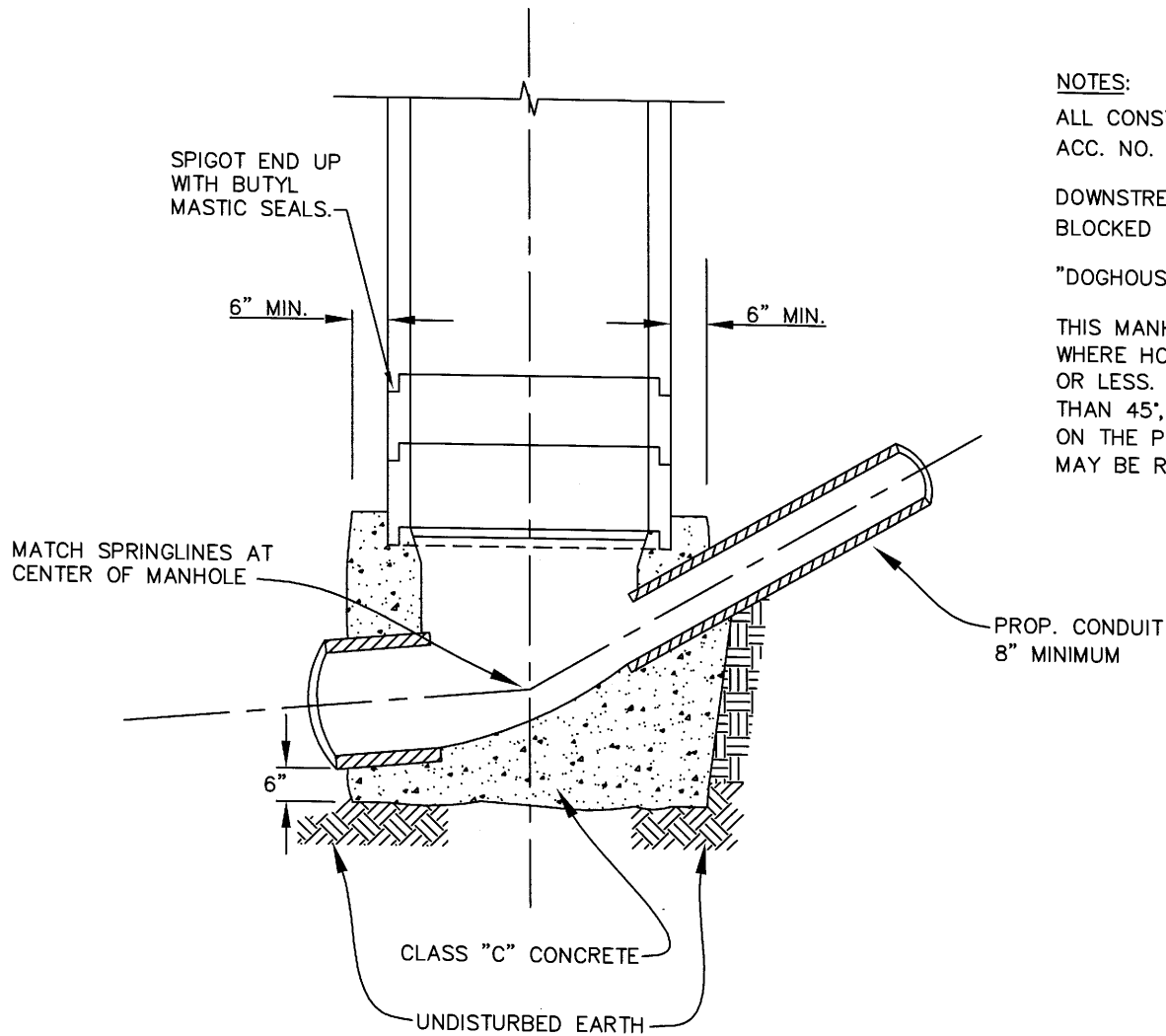
NO SCALE  
APPROVED:

*[Signature]*  
SEWERS CHIEF ENGINEER

DATE: AUG., 2006

T.P.

ACC. NO. 49045



**NOTES:**

ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH ACC. NO. 49037 FOR A 4' OR 5' DIA. MANHOLE.

DOWNSIDE SIDE OF MANHOLE SHALL BE KEY BLOCKED INTO UNDISTURBED EARTH.

"DOGHOUSE" MANHOLE CONSTRUCTION METHOD IS ACCEPTABLE.

THIS MANHOLE SHALL BE RESTRICTED TO LOCATIONS WHERE HORIZONTAL DEFLECTION OF MAINLINE IS 45° OR LESS. IF THE DEFLECTION OF MAINLINE IS GREATER THAN 45°, A DETAIL OF THE MANHOLE SHALL BE SHOWN ON THE PLANS AND A 6' DIA. OR LARGER MANHOLE BASE MAY BE REQUIRED TO ALLOW A SMOOTH FLOW TRANSITION.

THE  
METROPOLITAN SEWER DISTRICT  
OF  
GREATER CINCINNATI  
**STANDARD MANHOLE FOR  
SANITARY CONDUITS ON  
STEEP SLOPES**

NO SCALE

DATE: JUNE, 2009

APPROVED: *Thomas Schweers*  
SEWERS CHIEF ENGINEER

M.C.

ACC. NO. 49046

FLOOR BOX FRAME AND LID NEENAH R-7506-E OR ACCEPTED EQUIVALENT, LID SHALL BE LABELED 'STORM' WITH 1" RAISED LETTERING

EXISTING HARD SURFACE

THREADED PLUG; PLASTIC TRENDS PART #D1156 OR EQUAL

FEMALE ADAPTOR; PLASTIC TRENDS PART #D1406 OR EQUAL

SAND OR GRAVEL

6" DIAMETER

PVC

ADD 6-INCH "HAND-TITE" EXPANSION PLUG, R.C. GRAHAM COMPANY OR APPROVED EQUAL, WHEN INSTALLED FOR FUTURE USE (TYPICAL)

HARD SURFACE

6"x6"x6" TWO WAY CLEANOUT PLASTIC TRENDS PART #G1006, MULTI-FITTINGS PART #043708 OR APPROVED EQUAL

EXISTING GROUND

8"-12" DEPTH

THREADED PLUG; PLASTIC TRENDS PART #D1156 OR EQUAL

FEMALE ADAPTOR; PLASTIC TRENDS PART #D1406 OR EQUAL

DUCTILE IRON PIPE SLEEVE, 6" MINIMUM LENGTH, EXTEND 1"-2" ABOVE TOP OF CLEANOUT

SAND OR GRAVEL

6" DIAMETER

PVC

SOFT SURFACE

THE METROPOLITAN SEWER DISTRICT OF GREATER CINCINNATI  
**STANDARD CLEANOUT ON STORM TAPS**

NO SCALE

DATE: AUG. 2011

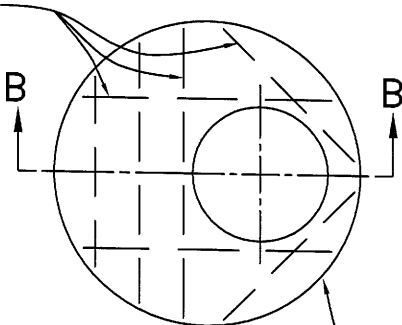
APPROVED:

*Ralph Johnston*  
 SEWERS CHIEF ENGINEER

M.C.

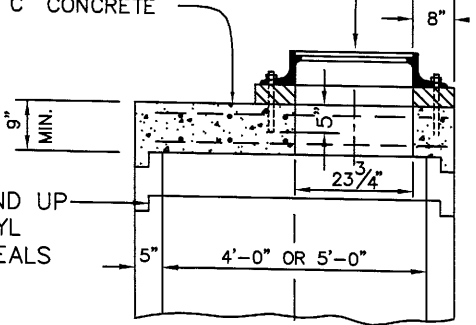
ACC. NO. 49047

#6 BARS  
TOP &  
BOTTOM



FLATTOP MANHOLE PER  
ACC. NO. 49049 TYPE "B"

CLASS "C" CONCRETE



SPIGOT END UP  
WITH BUTYL  
MASTIC SEALS

STANDARD TYPE "T" MANHOLE BASE  
(ACC. NO. 49040 OR 49040-A)

SECTION A-A

NOTES:

PRECAST CONCRETE BARRELS SHALL BE IN ACCORDANCE WITH ITEM 706.13 OF THE SPECIFICATIONS.

JOINTS ON MANHOLE SECTIONS SHALL BE MADE WITH A RUBBER GASKET MEETING THE REQUIREMENT OF ASTM C-443, EXCEPT THAT ONLY "O" RING AND PROFILE GASKETS ARE ACCEPTABLE.

LIFT HOLES IN MANHOLES TO BE SEALED WITH HYDRAULIC CEMENT.

1' PRECAST MANHOLE SECTION TO BE SET WHEN MANHOLE TOP IS POURED.

ALL CONCRETE SHALL BE CLASS "C".

ALL REINFORCING STEEL SHALL HAVE A MINIMUM COVER OF 1 1/2" BOTH FACES.

STEPS CONSTRUCTED OF RUBBER COATED CAST IRON, STAINLESS STEEL, OR FIBER REINFORCED PLASTIC SHALL BE PROVIDED ON ALL MANHOLES.

THE  
METROPOLITAN SEWER DISTRICT  
OF  
GREATER CINCINNATI  
**MODIFIED  
TYPE "T"  
MANHOLES**

NO SCALE

DATE: DEC. 2010

APPROVED:

*Ralph J. ...*  
SEWERS CHIEF ENGINEER

M.C.

ACC. NO. 49048

**NOTES:**

\*MANHOLE FRAMES SHALL BE SECURELY FASTENED BY (4) 7/8" STAINLESS STEEL ANCHOR BOLTS. DOWEL HOLES SHALL BE IN ACCORDANCE WITH ITEM 510 OF THE SPECIFICATIONS. FRAME AND COVER SHALL BE ACC. NO. 49005.

ALL REINFORCING STEEL SHALL HAVE A MINIMUM COVER OF 1 1/2" BOTH FACES.

JOINTS ON MANHOLE SECTIONS SHALL BE MADE WITH A RUBBER GASKET MEETING THE REQUIREMENTS OF ASTM C-443, EXCEPT THAT ONLY "O" RING AND PROFILE GASKETS ARE ACCEPTABLE.

LIFT HOLES IN MANHOLES SHALL BE SEALED WITH HYDRAULIC CEMENT.

1' PRECAST MANHOLE SECTION SHALL BE SET WHEN MANHOLE TOP IS POURED.

ALL OTHER CHARACTERISTICS ARE SIMILAR TO STANDARD MANHOLES.

ALL CONCRETE SHALL BE CLASS "C".

PRECAST CONCRETE BARRELS SHALL BE IN ACCORDANCE WITH ITEM 706.13 OF THE SPECIFICATIONS.

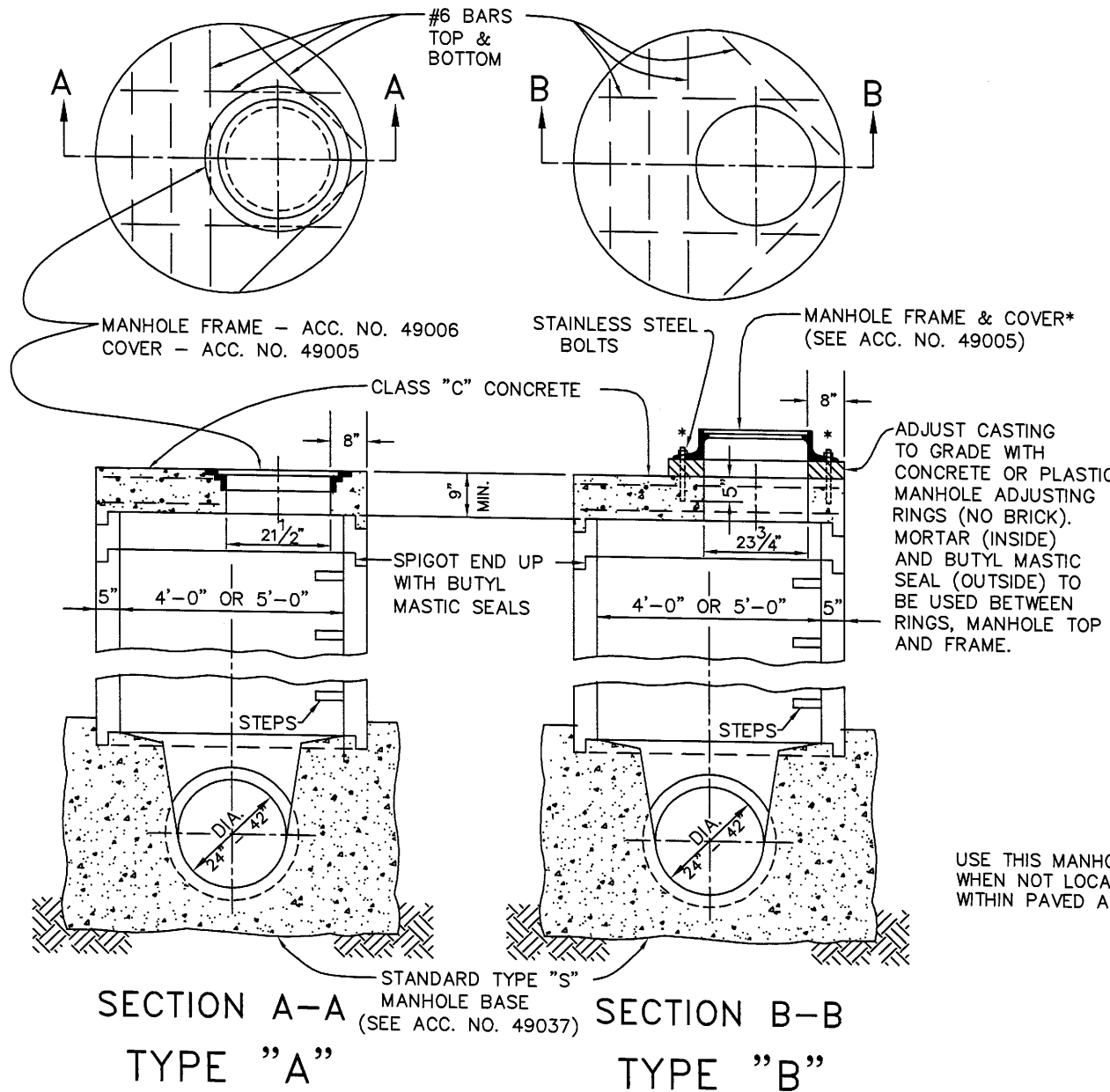
STEPS CONSTRUCTED OF RUBBER COATED CAST IRON, STAINLESS STEEL, OR FIBER REINFORCED PLASTIC SHALL BE PROVIDED ON ALL MANHOLES.

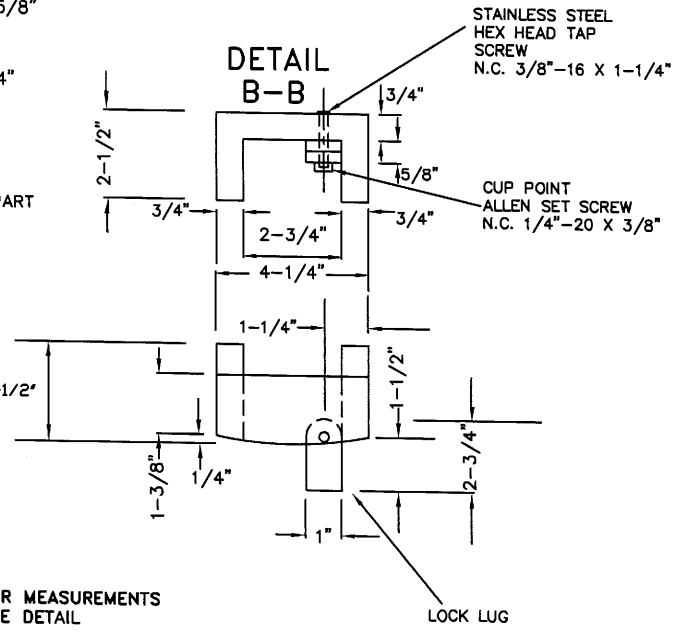
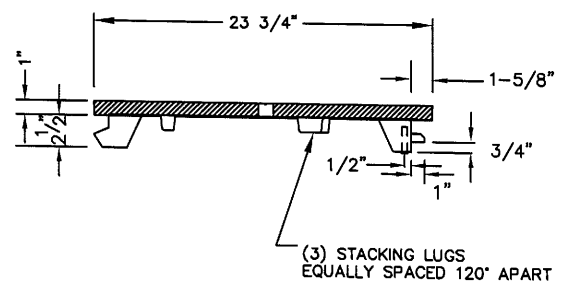
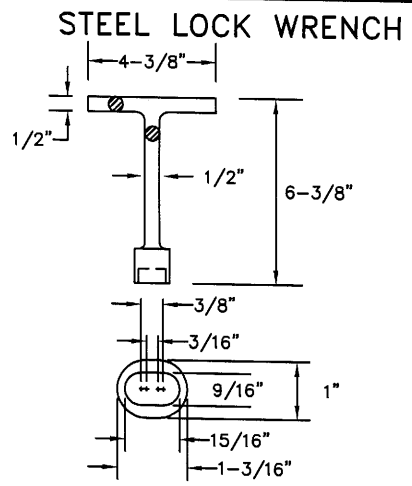
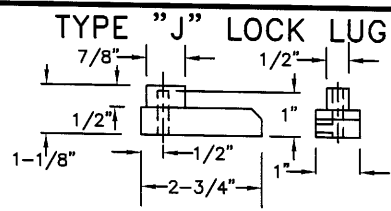
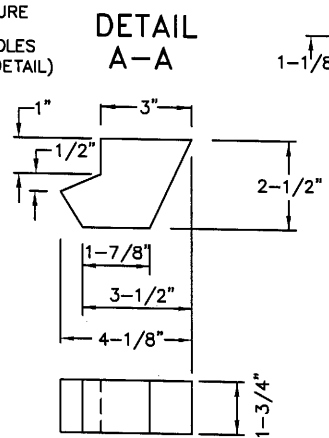
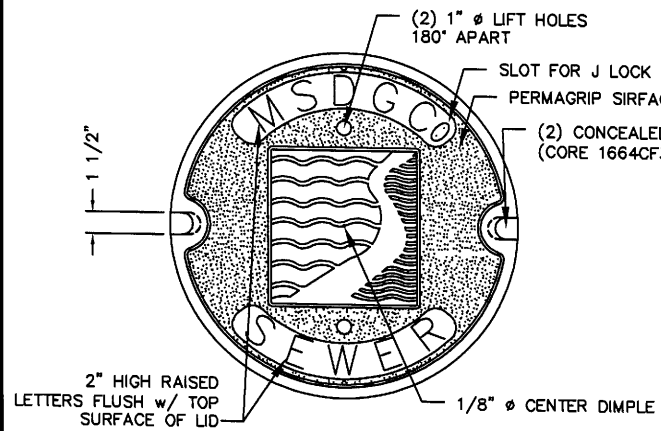
A MIN. 12" WIDTH EXTERIOR SEALANT WRAP, SUCH AS "WRAPIDSEAL" OR APPROVED EQUAL, SHALL BE PROVIDED AROUND JOINTS AND CASTING IN HIGH WATER TABLES, WHEN SPECIFIED ON PLANS.

USE THIS MANHOLE WHEN NOT LOCATED WITHIN PAVED AREAS.

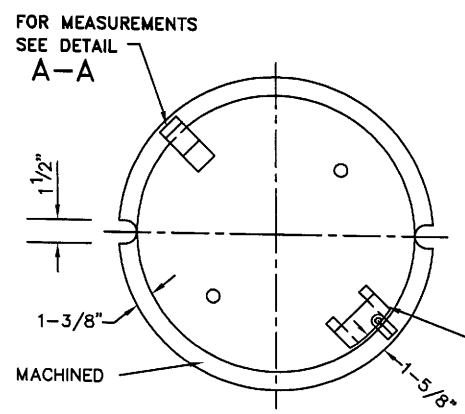
THE  
METROPOLITAN SEWER DISTRICT  
OF  
GREATER CINCINNATI  
MODIFIED  
TYPE "S" MANHOLES  
(CONDUITS 24" - 42" DIA)

NO SCALE DATE DEC. 2010  
APPROVED: *Ralph J. Kinosh*  
SEWERS CHIEF ENGINEER





NOTE: FOR USE WITH STANDARD MANHOLE FRAME ACC. NO. 49006 THIS COVER SHALL BE USED ONLY WHERE SPECIFIED ON THE PLANS



FOR MEASUREMENTS SEE DETAIL B-B

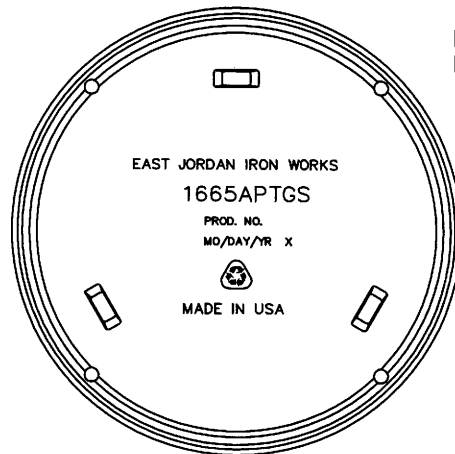
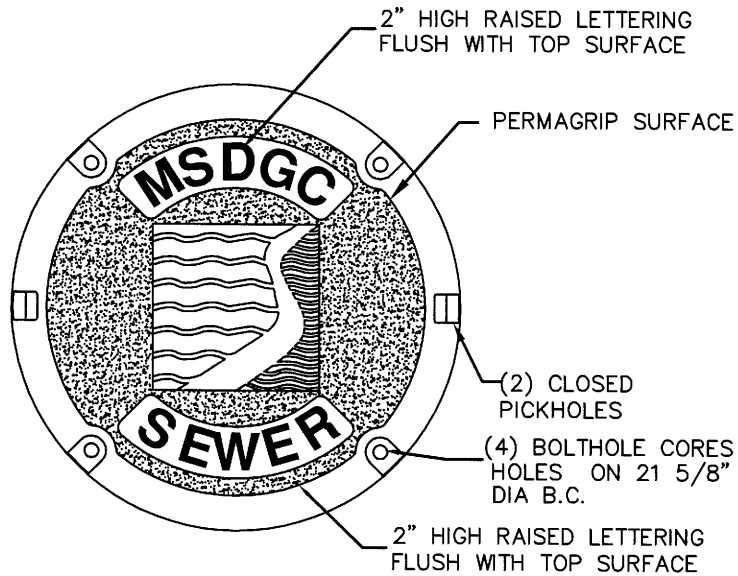
THE METROPOLITAN SEWER DISTRICT OF GREATER CINCINNATI  
**LOCKING LID MANHOLE**

NO SCALE APPROVED:

DATE: AUG., 2006  
SEWERS CHIEF ENGINEER

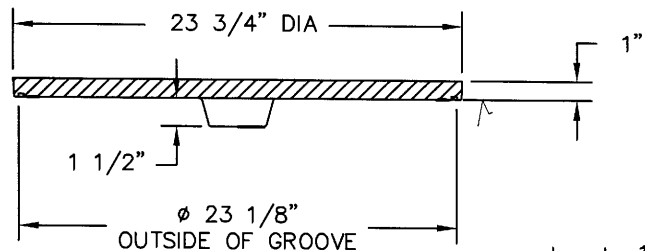
J.R.S.

ACC. NO. 49050

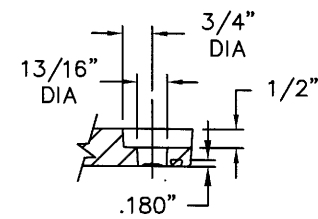


LID SPEC: EAST JORDAN PRODUCT #00166527,  
 1665 APT COVER  
 LID MATERIAL: CAST GRAY IRON ASTM A48, CLASS 35B  
 LID FINISH: NO PAINT

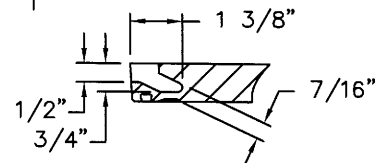
**BOTTOM VIEW**



**COVER SECTION**



**BOLT HOLE SECTION**



**PICKHOLE DETAIL**

**NOTE:** THIS COVER SHALL BE USED ONLY WHERE SPECIFIED ON THE PLANS. FOR USE WITH STANDARD MANHOLE FRAMES ACC. NO.'S 49005 & 49006.

NEOPRENE GASKET SHALL BE PROVIDED IN LID OR FRAME AS NECESSARY TO PROVIDE A WATERTIGHT SEAL.

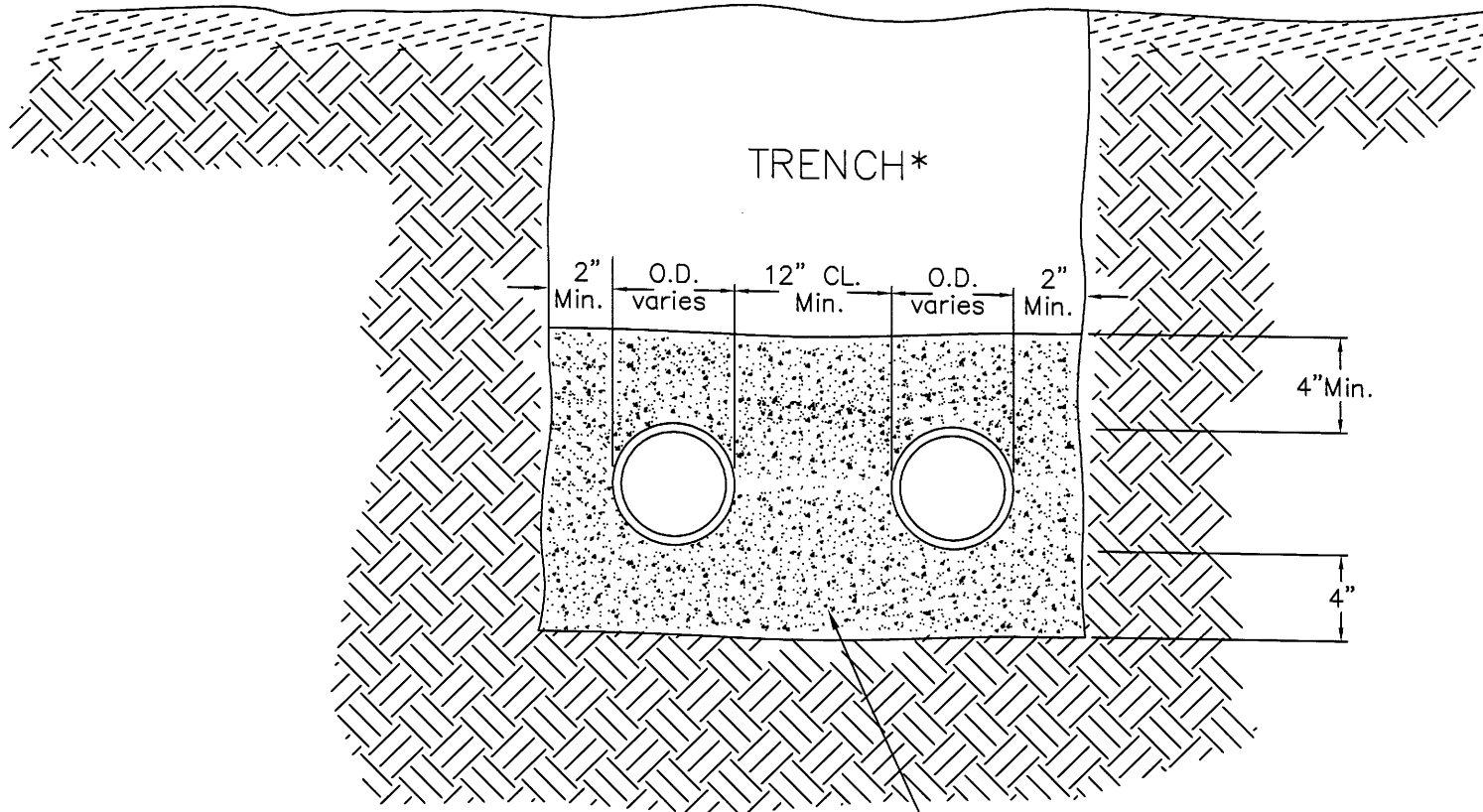
THE  
 METROPOLITAN SEWER DISTRICT  
 OF  
 GREATER CINCINNATI

**WATERTIGHT LID**

NO SCALE DATE: AUG. 2011  
 APPROVED: *Ralph Johnston*  
 SEWERS CHIEF ENGINEER

M.C.

**ACC. NO. 49051**



\* If Ductile Iron Pipe (Type "G") is used within the trench, granular bedding and backfill may be used in place of concrete in accordance with 603.06 and 603.10.

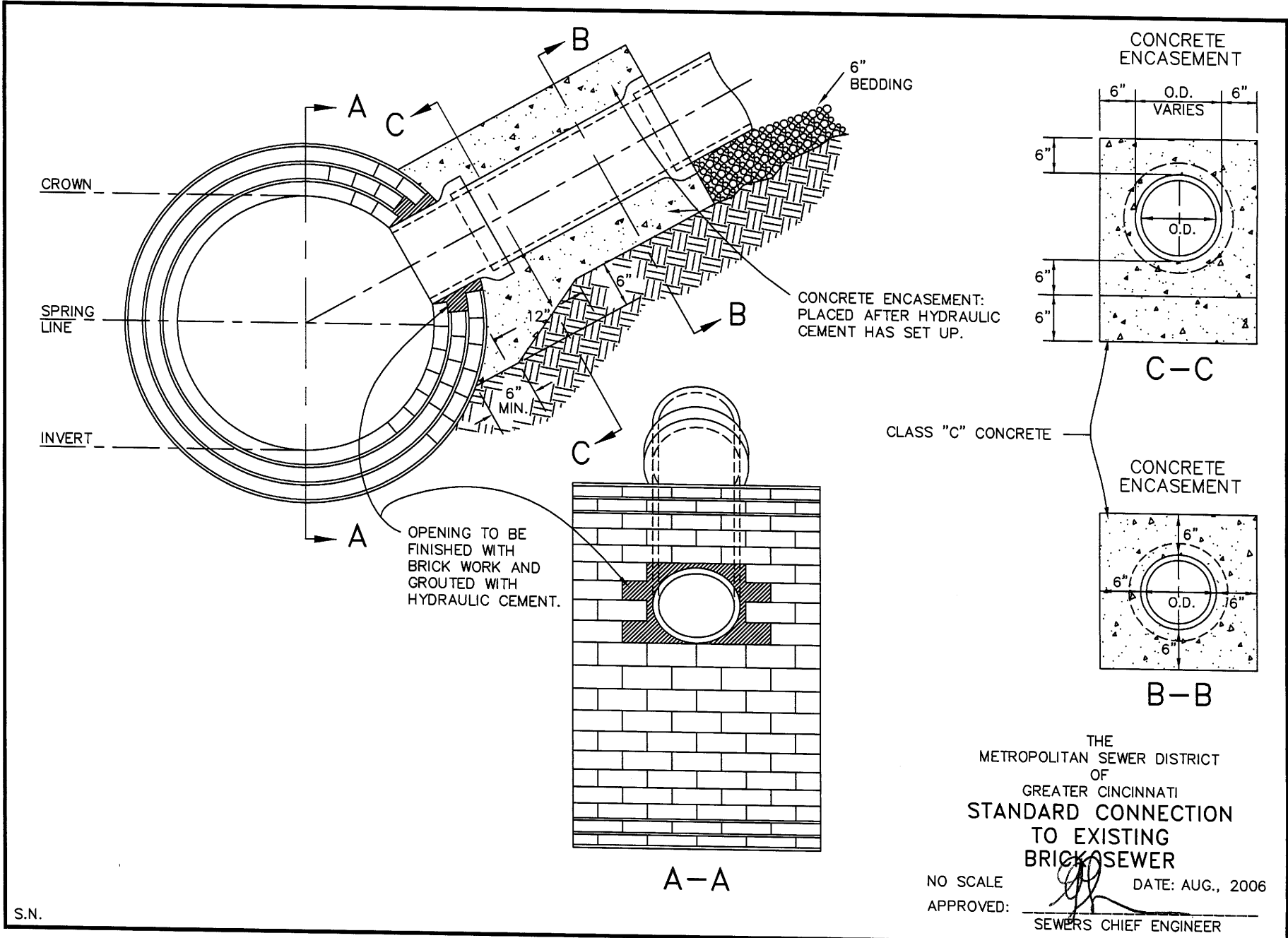
**NOTE:** MINIMUM REQUIREMENT FOR TWO (2) PIPES IN ONE (1) TRENCH. (TO BE USED ONLY WITH SPECIAL PERMISSION AS AUTHORIZED BY M.S.D.)

Class "C" Concrete  
(Dry Mix is Permissible)

THE  
METROPOLITAN SEWER DISTRICT  
OF  
GREATER CINCINNATI  
**SPECIAL DETAIL FOR LAYING  
TWO BUILDING SEWERS  
IN ONE TRENCH**  
NO SCALE  
APPROVED: \_\_\_\_\_ DATE: AUG., 2006  
SEWERS CHIEF ENGINEER

S.N.


ACC. NO. 49052



S.N.

REV. APRIL, 1982  
REV. MAY, 1995

THE  
METROPOLITAN SEWER DISTRICT  
OF  
GREATER CINCINNATI  
**STANDARD CONNECTION  
TO EXISTING  
BRICK SEWER**

NO SCALE  
APPROVED:  DATE: AUG., 2006  
SEWERS CHIEF ENGINEER

ACC. NO. 49053

GRADE STAKE: SHALL BE SET AT THE MANHOLES AND 25' INTERVALS THEREAFTER, EXCEPT WHERE A LASER BEAM IS USED. FOR LASER BEAM CONSTRUCTION, A GRADE STAKE SHALL BE SET AT THE MANHOLE AND 50' INTERVALS THEREAFTER.

BATTER BOARD: SHALL BE A STRAIGHT WOOD BOARD, A MINIMUM OF 2" X 6", AND SHALL BE CLAMPED LEVEL, WITH THE TOP AT THE PROPER GRADE OFFSET, TO EITHER METAL OR WOOD UPRIGHTS WHICH ARE DRIVEN SECURELY INTO THE GROUND. BATTER BOARDS SHALL BE AT 25' INTERVALS WITH A MINIMUM OF 3 BEING SET UP AT ALL TIMES. BATTER BOARDS SHALL BE SET PERPENDICULAR TO THE CENTER LINE OF THE PIPE AT EACH GRADE STAKE. BATTER BOARDS SHALL SPAN THE TRENCH, UNLESS OTHERWISE DIRECTED BY THE ENGINEER. A GRADE STRING SHALL BE STRETCHED BETWEEN THE 3 BATTER BOARDS, OVER THE CENTER LINE OF THE PIPE, TO CHECK LINE AND GRADE. FOR LASER BEAM CONSTRUCTION, A BATTER BOARD SHALL BE SET EVERY 50' TO CHECK LINE AND GRADE.

GRADE POLE: SHALL BE A STRAIGHT POLE WITH ROUNDED EDGES, APPROXIMATELY 2" X 2", WITH LENGTH DEPENDING ON NEED. THE GRADE POLE SHALL BE EQUIPPED WITH A METAL BRACKET ON THE BOTTOM WITH PROJECTING LENGTH OF 12"±. NAILS SHALL BE PLACED INTO THE GRADE POLE FOR DEPTH OF THE FLOW LINE BELOW THE GRADE STRING AND FOR THE DEPTH OF TRENCH. SPIRIT LEVELS SHALL BE USED ON THE GRADE POLE TO DETERMINE WHEN THE GRADE POLE IS VERTICAL.

NOTE: INSPECTOR'S COPY OF "CUT SHEET" SHALL BE ON PROJECT BEFORE PIPE IS LAID.

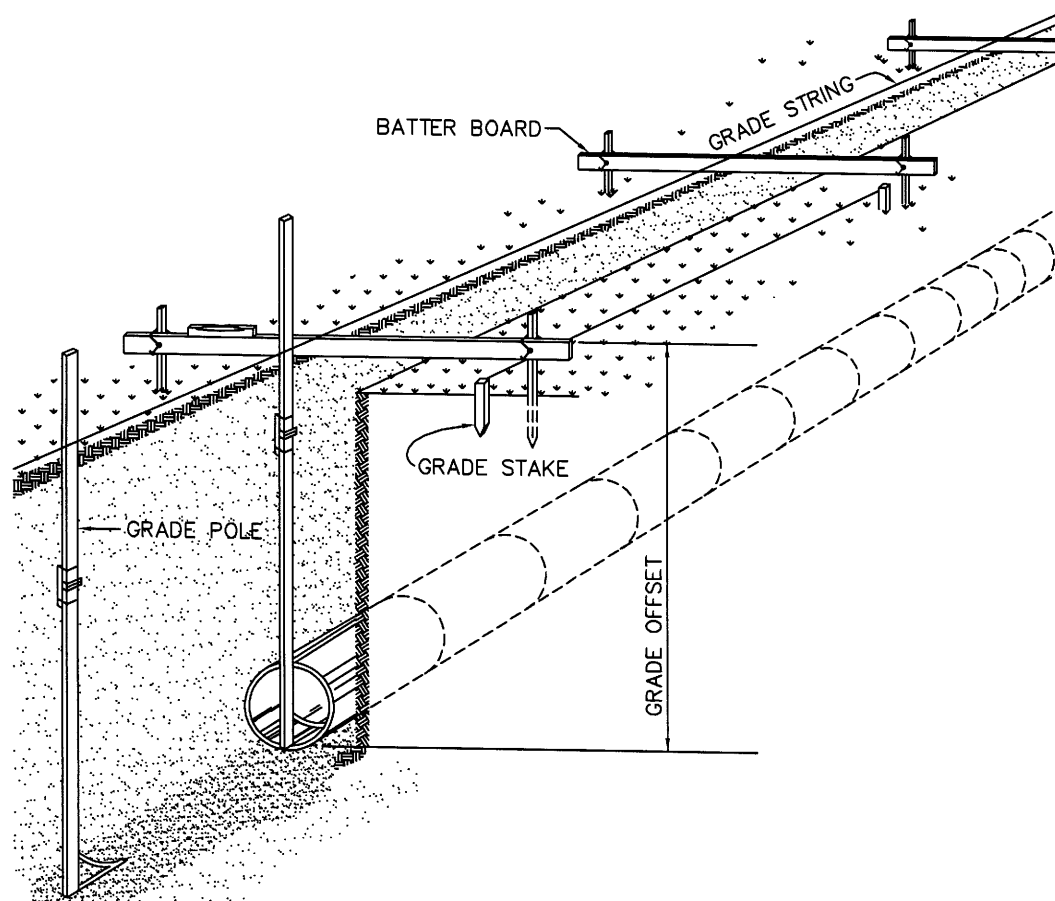
FOR TRENCH DETAILS AND BEDDING  
SEE ACCESSION NO. 49032

THE  
METROPOLITAN SEWER DISTRICT  
OF  
GREATER CINCINNATI  
**STANDARD  
BATTER BOARD**

NO SCALE  
APPROVED:

DATE: AUG., 2006

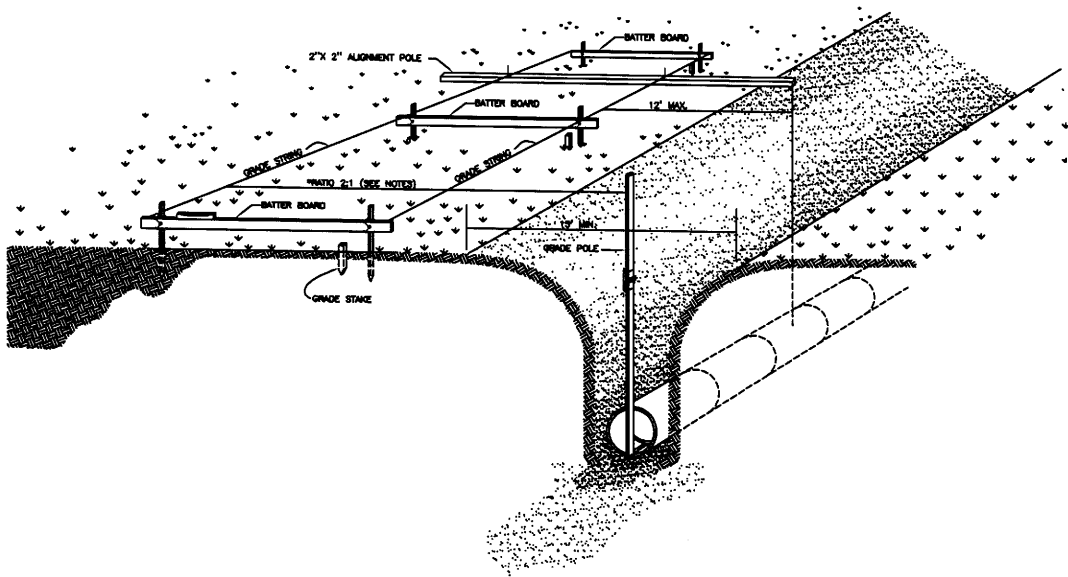
*[Signature]*  
SEWERS CHIEF ENGINEER



LAYING PIPE

T.R.S.

ACC. NO. 49054



**DOUBLE STRING METHOD:**

MAY BE USED ONLY WHEN OPEN CUT TRENCH TOP EXCEEDS 15 FEET AND WHEN SLOPE OF PIPE EXCEEDS 0.80%.

LASER OR BATTER BOARDS (ACC. NO. 49054) ARE REQUIRED FOR SLOPES LESS THAN 0.80%.

\* PROJECTION OF STRINGS SHALL NOT EXCEED RATIO OF TWO TO ONE, i.e., IF DISTANCE FROM CLOSEST STRING TO PIPE IS 10 FEET, THEN DISTANCE BETWEEN STRINGS SHALL NOT BE LESS THAN 5 FEET. MAXIMUM OFFSET TO NEAREST STRING SHALL BE 12 FEET.

GRADE STAKE: SHALL BE SET AT THE MANHOLES AND 25' INTERVALS THEREAFTER, EXCEPT WHERE A LASER BEAM IS USED. FOR LASER BEAM CONSTRUCTION, A GRADE STAKE SHALL BE SET AT MANHOLE AND 50' INTERVALS THEREAFTER.

BATTER BOARD: SHALL BE A STRAIGHT WOOD BOARD, A MINIMUM OF 2" X 4", AND SHALL BE CLAMPED LEVEL, WITH THE TOP AT THE PROPER GRADE OFFSET, TO EITHER METAL OR WOOD UPRIGHTS WHICH ARE DRIVEN SECURELY INTO THE GROUND. BATTER BOARDS SHALL BE AT 25' INTERVALS WITH A MINIMUM OF 3 BEING SET UP AT ALL TIMES. BATTER BOARDS SHALL BE SET PERPENDICULAR TO THE CENTER LINE OF THE PIPE AT EACH GRADE STAKE. GRADE STRINGS SHALL BE STRETCHED BETWEEN THE 3 BATTER BOARDS TO CHECK LINE AND GRADE. FOR LASER BEAM CONSTRUCTION A BATTER BOARD SHALL BE SET EVERY 50' TO CHECK LINE AND GRADE.

GRADE POLE: SHALL BE A STRAIGHT POLE WITH ROUNDED EDGES, APPROXIMATELY 2" X 2", WITH LENGTH DEPENDING ON NEED. THE GRADE POLE SHALL BE EQUIPPED WITH A METAL BRACKET ON THE BOTTOM WITH PROJECTING LENGTH OF 12" ±. NAILS SHALL BE PLACED INTO THE GRADE POLE FOR DEPTH OF THE FLOW LINE BELOW THE GRADE STRING AND FOR THE DEPTH OF TRENCH. SPIRIT LEVELS SHALL BE USED ON THE GRADE POLE TO DETERMINE WHEN THE GRADE POLE IS VERTICAL.

A 2" X 2" MARKED POLE, WITH PLUMB BOB SHALL BE USED FOR CENTER LINE MEASUREMENTS (ALIGNMENT).

**NOTE:** INSPECTOR'S COPY OF "CUT SHEET" SHALL BE ON PROJECT BEFORE PIPE IS LAID.

FOR TRENCH DETAILS AND BEDDING SECTION SEE ACCESSION NO. 49032

THE  
METROPOLITAN SEWER DISTRICT  
OF  
GREATER CINCINNATI

ALTERNATE  
BATTER BOARD

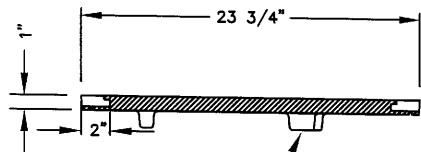
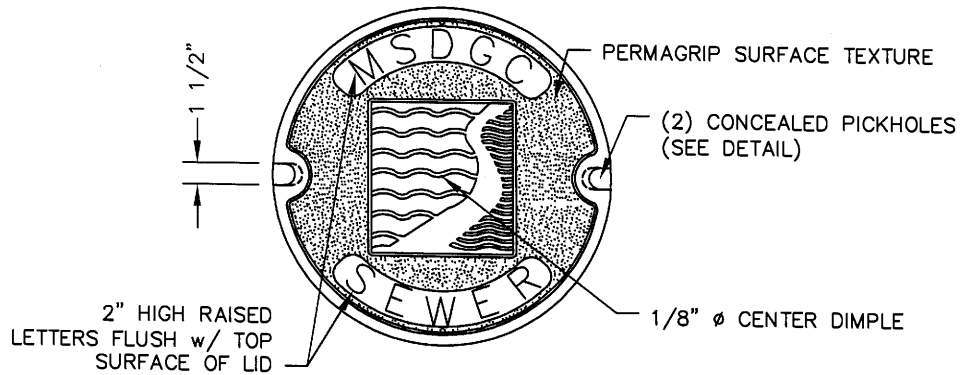
NO SCALE

DATE: AUG., 2006

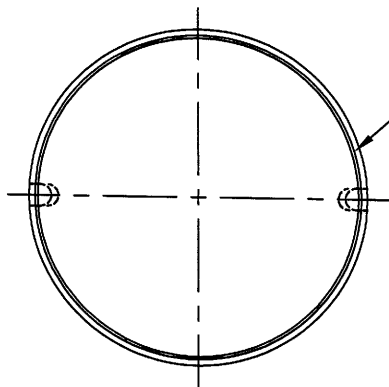
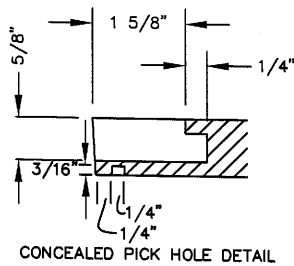
APPROVED: \_\_\_\_\_

SEWERS CHIEF ENGINEER

ACC. NO. 49054-A



(3) STACKING LUGS  
EQUALLY SPACED 120° APART



NOTE:

FOR USE WITH STANDARD MANHOLE FRAME ACC. NO. 49005. THIS COVER SHALL BE USED ONLY WHERE SPECIFIED ON THE PLANS.

FOR MEASUREMENTS, MATERIAL FINISH, AND INSPECTION, REFER TO PURCHASING SPEC. NO. 11-34 (LATEST EDITION).

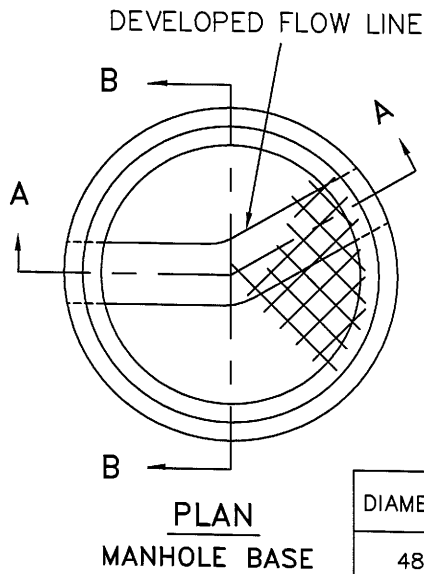
COMPUTED WEIGHTS  
LID 120lbs.

THE  
METROPOLITAN SEWER DISTRICT  
OF  
GREATER CINCINNATI  
SELF - SEALING  
MANHOLE LID

NO SCALE  
APPROVED:

DATE: AUG., 2006  
  
SEWERS CHIEF ENGINEER

ACC. NO. 49055



PIPE DIAMETER	DIMENSION			
	A	B	C	D
8" THRU 18"	48"	5"	2"-3"	UP TO 1 1/2"
21" & 24"	48"	5"*	2"-3"	"
	60"	6"*	2"-3"	"
27" - 36"	60"	6"	2"-3"	UP TO 1 1/2"

\* MOVEABLE PANEL CONSTRUCTION MAY BE USED PROVIDING 5" MIN. THICKNESS PROVIDED.

REINFORCEMENT STEEL PER A.S.T.M. C478

DIAMETER	REINFORCING ITEM	
	E	F
48"	A <sup>S</sup> = 0.12 SQ. IN./FT. (CIRCUMFERENTIAL)	A <sup>S</sup> = 0.12 SQ. IN./FT. (BOTH WAYS)
60"	A <sup>S</sup> = 0.15 SQ. IN./FT. (CIRCUMFERENTIAL)	A <sup>S</sup> = 0.12 SQ. IN./FT. (BOTH WAYS)

PRECAST MANHOLE BASE MAY BE USED ON 8" TO 36" CONDUIT UNLESS OTHERWISE NOTED ON THE PLANS.

PRECAST MANHOLE BASE SHALL NOT BE USED IF THE GRADE OF THE INFLUENT OR EFFLUENT CONDUIT EXCEEDS 10%, UNLESS THE SEAL BETWEEN THE PRECAST MANHOLE BASE AND INFLUENT AND/OR EFFLUENT LINES IS CAST IN A SKEW TO ACCEPT LARGER GRADES. ALL MATERIAL SHALL BE IN ACCORDANCE WITH SECTION 706.13 OF THE STATE OF OHIO SPECIFICATIONS EXCEPT AS OTHERWISE NOTED HEREIN.

ALL CONCRETE SHALL BE CLASS "C".

THE GASKET BETWEEN THE PRECAST MANHOLE BASE AND THE MANHOLE RISERS SHALL MEET THE REQUIREMENTS OF A.S.T.M. C-443, EXCEPT THAT ONLY "O" RING AND PROFILE GASKETS ARE ACCEPTABLE.

THE SEAL BETWEEN PRECAST MANHOLE BASE AND INFLUENT AND/OR EFFLUENT CONDUIT SHALL BE A RUBBER GASKET, "A-LOK", "KOR-N-SEAL", "DURA-SEAL" OR AN APPROVED EQUAL.

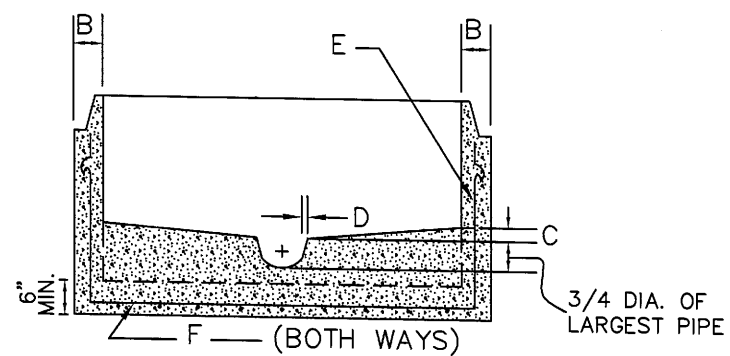
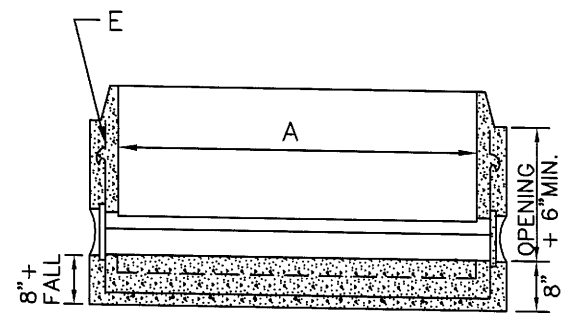
OPENINGS FOR INFLUENT AND EFFLUENT CONDUIT SHALL BE PROVIDED TO MEET THE PROJECT REQUIREMENTS.

THE PRECAST BASE SHALL HAVE THE FLOOR AND SIDE WALL CAST AS ONE UNIT; IF THE FLOW LINE (CHANNEL) AND BENCHES ARE NOT CAST AS A PART OF FLOOR AND SIDE WALL, THEY SHALL BE CAST OF CONCRETE AT THE PLACE OF MANUFACTURE.

LIFT HOLES IN PRECAST MANHOLE BASE TO BE SEALED WITH HYDRAULIC CEMENT.

ALL CHARACTERISTICS NOT SHOWN HEREON SHALL BE SIMILAR TO STANDARD MANHOLE ACC. NO. 49037 OR 49049.

PRECAST MANHOLE BASES SHALL BE INSTALLED ON A 6" MINIMUM GRAVEL BASE (#57 CLEAN WASHED).

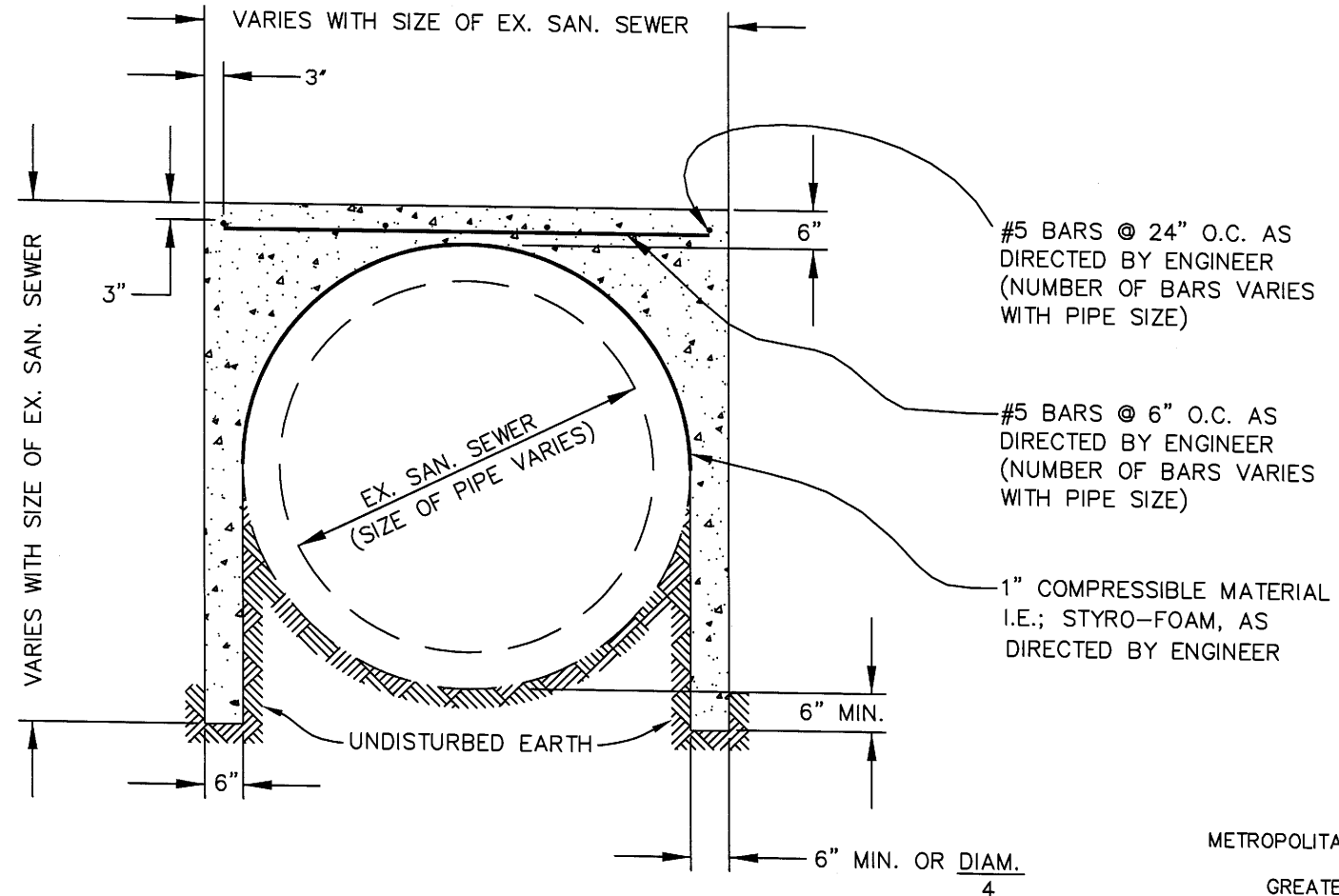


THE METROPOLITAN SEWER DISTRICT OF GREATER CINCINNATI  
STANDARD PRECAST CONCRETE MANHOLE BASE

NO SCALE DATE: DEC. 2010  
APPROVED: *Ralph Johnston*  
SEWERS CHIEF ENGINEER

ACC. NO. 49056

NOTE: CONCRETE SHALL BE CLASS "C".



#5 BARS @ 24" O.C. AS DIRECTED BY ENGINEER (NUMBER OF BARS VARIES WITH PIPE SIZE)

#5 BARS @ 6" O.C. AS DIRECTED BY ENGINEER (NUMBER OF BARS VARIES WITH PIPE SIZE)

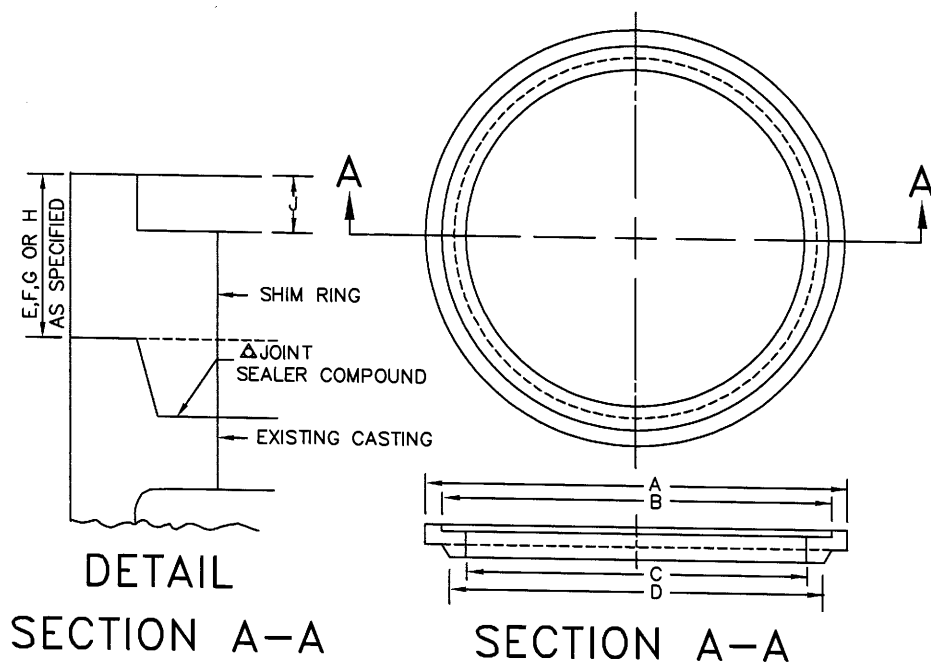
1" COMPRESSIBLE MATERIAL I.E.; STYRO-FOAM, AS DIRECTED BY ENGINEER

THE METROPOLITAN SEWER DISTRICT OF GREATER CINCINNATI  
TYPICAL ENCASEMENT FOR EXISTING SANITARY PIPE

NO SCALE DATE: AUG., 2006  
APPROVED:  SEWERS CHIEF ENGINEER

C.J.K./T.R.S.

ACC. NO. 49057



DETAIL  
SECTION A-A

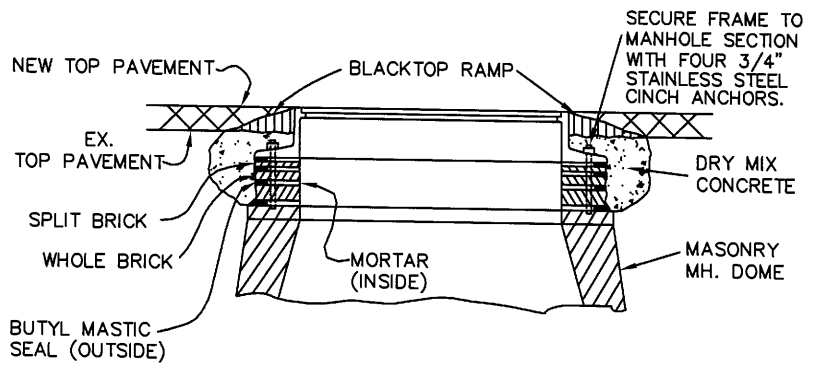
SECTION A-A

CASTING	DIMENSIONS IN INCHES									
	A	B	C	D	E	F	G	H	J	
MANHOLE	26	24	21½	23¾	1½	2	2½	3	1	

MATERIAL - ASTM DESIGNATION: A-48, CLASS 40 CAST IRON

**INSTALLATION OF SHIM RING**

1. CLEAN CASTING WITH WIRE BRUSH.
  2. INSERT SHIM AND CHECK FIT.
  3. IF SHIM DOES NOT FIT PROPERLY, CASTING SHALL BE ADJUSTED BY USING BRICK AND MORTAR.
  4. REMOVE SHIM AND APPLY JOINT SEALER COMPOUND TO CASTING SEATING SURFACE.
  5. INSERT SHIM ON CASTING - STACKING OF RINGS SHALL NOT BE PERMITTED.
  6. USE PAVING BREAKER TO CUT OUT AROUND CASTING, 6"W. X 1 1/2"D.
  7. ADD STORAGE MIX BLACKTOP TO CUT AND FORM RAMP TO LIP OF CASTING. TAMP FIRMLY. RAMP SHALL BE REMOVED IMMEDIATELY PRIOR TO MACHINE PAVING.
  8. ALL MANHOLE FRAMES AND COVERS, OTHER THAN STANDARD, SHALL BE REPLACED WITH STANDARD CASTINGS. (ACC. NO. 49005)
- Δ IN ACCORDANCE WITH 706.10 OF THE STATE OF OHIO CONSTRUCTION AND MATERIALS SPECIFICATION.



**INSTALLATION OF BRICK AND MORTAR**

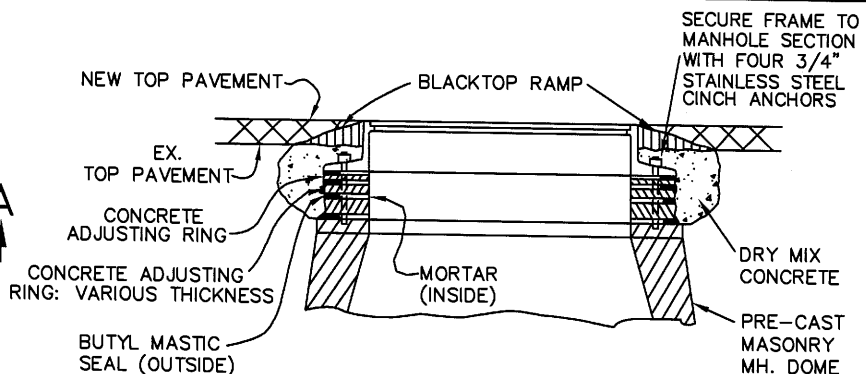
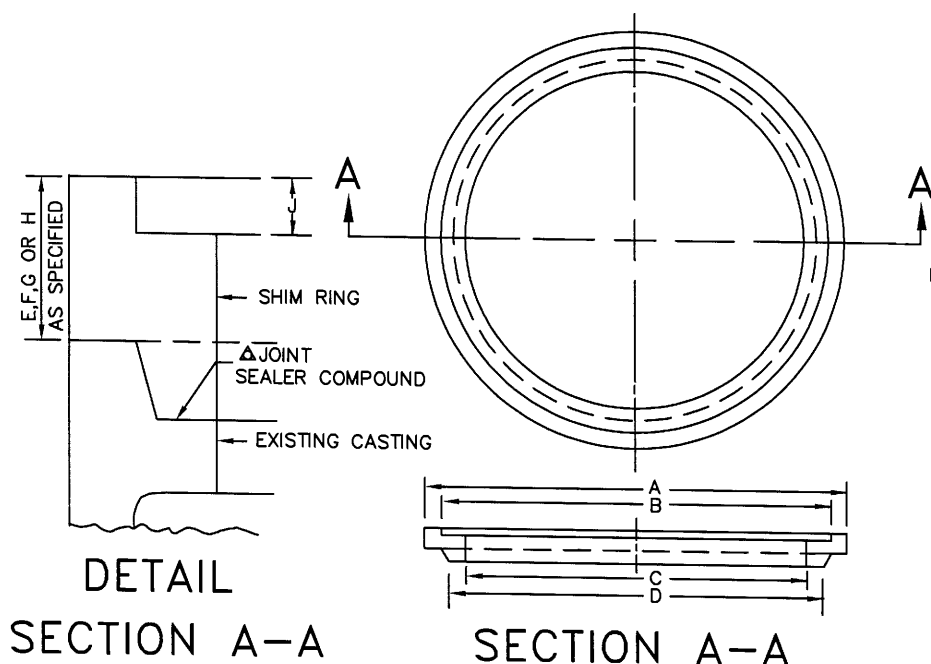
1. ALL MANHOLES ADJUSTED WITH BRICK AND MORTAR PRIOR TO MACHINE PAVING ARE PERMITTED TO BE ROUND CUT.
  2. IF NEW ADJUSTMENT OF MANHOLE ELEVATES CASTING GREATER THAN 12" ABOVE DOME SECTION OF MANHOLE, THAT MANHOLE SHALL BE RECONSTRUCTED IN ACCORDANCE WITH 604.03 OF THE CITY SUPPLEMENT OF THE STATE OF OHIO CONSTRUCTION AND MATERIAL SPECIFICATIONS.
  3. IF NEW ADJUSTMENT OF EXISTING MANHOLE IS LESS THAN 12" ABOVE DOME, THE CASTING SHALL BE CUT OUT TO TOP OF EXISTING MASONRY.
  4. THE CASTING SHALL THEN BE RAISED WITH A COMBINATION OF WHOLE AND/OR HALF BRICKS AND MORTAR TO DESIRED HEIGHT. THESE ADJUSTMENTS SHALL BE IN ACCORDANCE WITH 604.05 OF THE STATE OF OHIO CONSTRUCTION AND MATERIALS SPECIFICATIONS.
  5. DRY MIX CONCRETE SHALL BE USED FROM BOTTOM OF CUT TO EXISTING STREET PAVEMENT.
  6. ADD STORAGE MIX BLACKTOP TO FORM RAMP TO LIP OF CASTING. TAMP FIRMLY. RAMP SHALL BE REMOVED IMMEDIATELY PRIOR TO MACHINE PAVING.
  7. ALL MANHOLE FRAMES AND COVERS, OTHER THAN STANDARD, SHALL BE REPLACED WITH STANDARD CASTINGS. (ACC. NO. 49005)
- NOTE: BRICK & MORTAR ADJUSTMENT CAN ONLY BE USED WITH SPECIAL PERMISSION FROM THE SEWERS CHIEF ENGINEER. (SEE ACC. NO. 49058-A FOR TYPICAL MANHOLE ADJUSTMENT STANDARD.)

THE  
METROPOLITAN SEWER DISTRICT  
OF  
GREATER CINCINNATI  
**SANITARY MANHOLE ADJUSTMENT  
USING BRICK AND MORTAR  
PRIOR TO MACHINE PAVING**

NO SCALE  
APPROVED:   
DATE: AUG., 2006  
SEWERS CHIEF ENGINEER

(FORMERLY ACC. NO. 53941)

ACC. NO. 49058



**INSTALLATION OF CONCRETE RINGS AND MORTAR**

1. ALL MANHOLES ADJUSTED WITH CONCRETE RINGS AND MORTAR PRIOR TO MACHINE PAVING ARE PERMITTED TO BE ROUND CUT.
2. IF NEW ADJUSTMENT OF MANHOLE ELEVATES CASTING GREATER THAN 12" ABOVE DOME SECTION OF MANHOLE, THAT MANHOLE SHALL BE RECONSTRUCTED IN ACCORDANCE WITH 604.03 OF THE CITY SUPPLEMENT OF THE STATE OF OHIO CONSTRUCTION AND MATERIAL SPECIFICATIONS.
3. IF NEW ADJUSTMENT OF EXISTING MANHOLE IS LESS THAN 12" ABOVE DOME, THE CASTING SHALL BE CUT OUT TO TOP OF EXISTING MASONRY.
4. THE CASTING SHALL THEN BE RAISED WITH A COMBINATION OF CONCRETE ADJUSTING RINGS AND MORTAR TO DESIRED HEIGHT. THESE ADJUSTMENTS SHALL BE IN ACCORDANCE WITH 604.05 OF THE STATE OF OHIO CONSTRUCTION AND MATERIALS SPECIFICATIONS.
5. DRY MIX CONCRETE SHALL BE USED FROM BOTTOM OF CUT TO EXISTING STREET PAVEMENT.
6. ADD STORAGE MIX BLACKTOP TO FORM RAMP TO LIP OF CASTING. TAMP FIRMLY. RAMP SHALL BE REMOVED IMMEDIATELY PRIOR TO MACHINE PAVING.
7. ALL MANHOLE FRAMES AND COVERS, OTHER THAN STANDARD, SHALL BE REPLACED WITH STANDARD CASTINGS. (ACC. NO. 49005)
8. ADJUSTING RINGS SHALL HAVE A MINIMUM OF 1-#3 CONTINUOUS REINFORCING BAR IN CENTER.

**NOTE:** IF THE MANHOLE IS NOT PRECAST, THEN BRICK AND MORTAR SHALL BE PERMITTED.

THE  
METROPOLITAN SEWER DISTRICT  
OF  
GREATER CINCINNATI  
**SANITARY MANHOLE ADJUSTMENT WITH  
PRECAST CONCRETE RING & MORTAR  
PRIOR TO MACHINE PAVING**

NO SCALE DATE: AUG., 2006  
APPROVED: SEWERS CHIEF ENGINEER

CASTING	DIMENSIONS IN INCHES									
	A	B	C	D	E	F	G	H	J	
MANHOLE	26	24	21½	23¾	1½	2	2½	3	1	

MATERIAL - ASTM DESIGNATION: A-48, CLASS 40 CAST IRON

**INSTALLATION OF SHIM RING**

1. CLEAN CASTING WITH WIRE BRUSH.
  2. INSERT SHIM AND CHECK FIT.
  3. IF SHIM DOES NOT FIT PROPERLY, CASTING SHALL BE ADJUSTED BY USING CONCRETE RING AND MORTAR.
  4. REMOVE SHIM AND APPLY JOINT SEALER COMPOUND TO CASTING SEATING SURFACE.
  5. INSERT SHIM ON CASTING - STACKING OF RINGS SHALL NOT BE PERMITTED.
  6. USE PAVING BREAKER TO CUT OUT AROUND CASTING, 6"W. X 1 1/2"D.
  7. ADD STORAGE MIX BLACKTOP TO CUT AND FORM RAMP TO LIP OF CASTING. TAMP FIRMLY. RAMP SHALL BE REMOVED IMMEDIATELY PRIOR TO MACHINE PAVING.
  8. ALL MANHOLE FRAMES AND COVERS, OTHER THAN STANDARD, SHALL BE REPLACED WITH STANDARD CASTINGS. (ACC. NO. 49005)
- △ IN ACCORDANCE WITH 706.10 OF THE STATE OF OHIO CONSTRUCTION AND MATERIALS SPECIFICATION.

(ALTERNATE FOR ACC. NO. 49058)

B.W.

ACC. NO. 49058-A



ALLOWABLE CONDUIT SLOPE ENTERING AND EXITING THE MANHOLE SHALL BE A SPECIFIC MAXIMUM AND MINIMUM VALUE AS PER THE FOLLOWING TABLE:

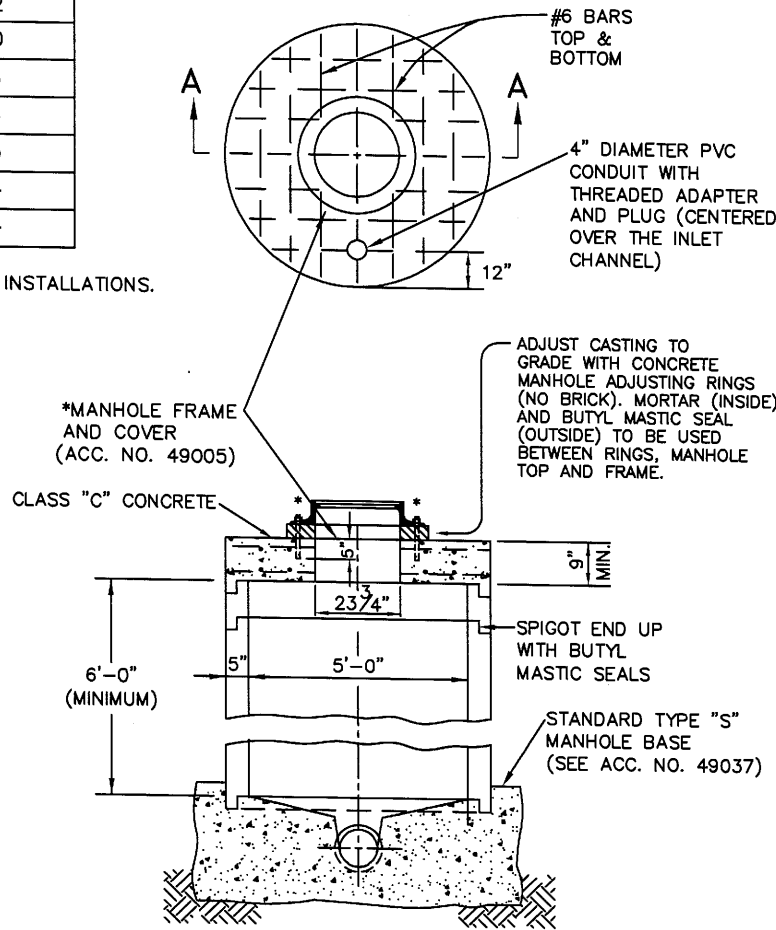
PIPE SIZE	MIN. % SLOPE	MAX. % SLOPE
6"	2.00	2.2
8"	0.70	2.0
10"*	0.50	1.8
12"	0.40	1.6
15"	0.30	1.5
18"	0.24	1.4
21"	0.19	1.4

\*10" CONDUIT NOT APPROVED FOR NEW INSTALLATIONS.

**NOTES:**

NO BENDS, DROP MANHOLES, FLOW JUNCTIONS, ETC., SHALL BE LOCATED WITHIN 25 PIPE DIAMETERS UPSTREAM OF THE CENTER OF THE MANHOLE.

DOWNSTREAM CONDUIT SLOPE SHALL BE GREATER THAN OR EQUAL TO THE UPSTREAM CONDUIT SLOPE WITH NO OBSTRUCTIONS LOCATED WITHIN TEN PIPE DIAMETERS DOWNSTREAM OF THE CENTER OF THE MANHOLE.



SECTION A-A

**NOTES:**

IN PROTECTED NON-TRAFFIC AREAS, THE STANDARD TYPE "C" SAMPLING AND GAUGING MANHOLE MAY BE USED WITH PRIOR APPROVAL.

ALL REINFORCING STEEL SHALL HAVE A MINIMUM COVER OF 2" BOTH FACES.

JOINTS ON MANHOLE SECTIONS SHALL BE MADE WITH A RUBBER GASKET MEETING THE REQUIREMENT OF ASTM C-443, EXCEPT THAT ONLY "O" RING AND PROFILE GASKETS ARE ACCEPTABLE.

LIFT HOLES IN MANHOLES TO BE SEALED WITH HYDRAULIC CEMENT

1' PRECAST MANHOLE SECTION TO BE SET WHEN MANHOLE TOP IS POURED.

ALL OTHER CHARACTERISTICS ARE SIMILAR TO STANDARD MANHOLES.

ALL CONCRETE SHALL BE CLASS "C".

PRECAST CONCRETE BARRELS SHALL BE IN ACCORDANCE WITH ITEM 706.13 OF THE SPECIFICATIONS.

\*MANHOLE FRAMES SHALL BE SECURELY FASTENED BY (4) 7/8" STAINLESS STEEL ANCHOR BOLTS. DOWEL HOLES SHALL BE IN ACCORDANCE WITH ITEM 510 OF THE SPECIFICATIONS.

THE  
METROPOLITAN SEWER DISTRICT  
OF  
GREATER CINCINNATI  
**STANDARD TYPE "B"  
SAMPLING & GAUGING  
MANHOLE**

NO SCALE  
APPROVED:

DATE: AUG., 2006

SEWERS CHIEF ENGINEER

DR/DJT

ACC. NO. 49059-B

**NOTES:**

AN ALUMINUM 3'-6" SQUARE SINGLE LEAF HINGED DOOR (BILCO J-5AL, OR EQUAL) SHALL BE INSTALLED IN THE MANHOLE SLAB TOP. A 3'-0" DOOR SHALL BE ALLOWED IN A PRECAST TOP. THE HINGED SIDE OF THE SQUARE LID IS TO BE ORIENTED PARALLEL TO THE DOWNSTREAM FLOW DIRECTION.

STEPS IN THE BARREL SECTION OF THE PRE-CAST MANHOLE ARE TO BE INSTALLED IN ALIGNMENT WITH THE DOWNSTREAM CORNER OF THE SQUARE LID ON THE OPPOSITE SIDE FROM THE LID HINGE.

A SEVEN BY ELEVEN FOOT CONCRETE PAD, FIVE INCHES THICK AND LEVEL WITH THE MANHOLE SLAB TOP, SHALL BE CONSTRUCTED SUCH THAT A MINIMUM FOUR FOOT SECTION IS ORIENTED OVER THE INLET PIPE.

ALLOWABLE CONDUIT SLOPE ENTERING AND EXITING THE MANHOLE SHALL BE LIMITED TO A SPECIFIC MAXIMUM AND MINIMUM AS PER THE FOLLOWING TABLE:

PIPE SIZE	MIN. % SLOPE	MAX. % SLOPE
6"	2.00	2.2
8"	0.70	2.0
10"*	0.50	1.8
12"	0.40	1.6
15"	0.30	1.5
18"	0.24	1.4
21"	0.19	1.4

\* 10" CONDUIT NOT APPROVED FOR NEW INSTALLATIONS

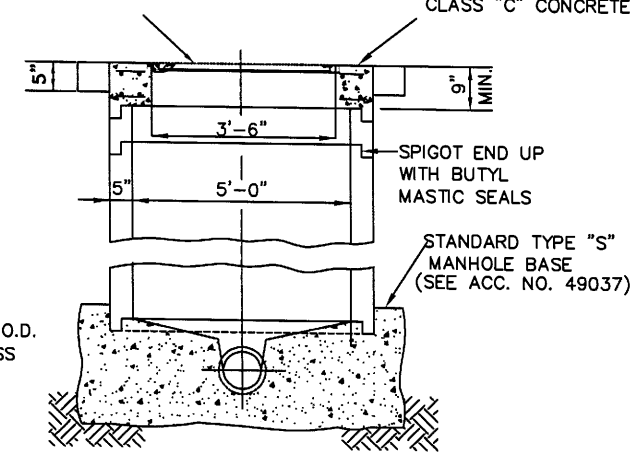
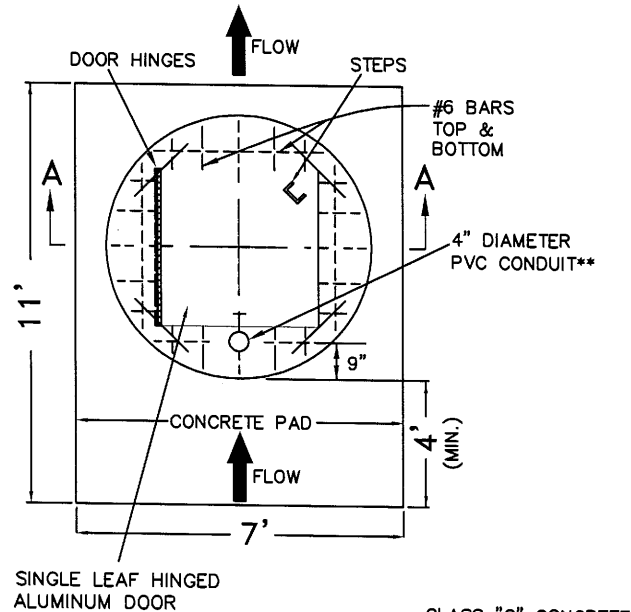
NO BENDS, DROP MANHOLES, FLOW JUNCTIONS, ETC., SHALL BE LOCATED WITHIN 25 PIPE DIAMETERS UPSTREAM OF THE CENTER OF THE MANHOLE.

DOWNSTREAM CONDUIT SLOPE SHALL BE GREATER THAN OR EQUAL TO UPSTREAM CONDUIT SLOPE WITH NO OBSTRUCTION WITHIN TEN PIPE DIAMETERS DOWNSTREAM OF THE CENTER OF THE MANHOLE.

AN APPROPRIATELY SIZED FLUME (PLASTIFAB WITH INTEGRAL APPROACH, OR EQUAL) SHALL BE INSTALLED ACCORDING TO MANUFACTURER'S SPECIFICATIONS WITH THE FOLLOWING "BUILT-IN ATTACHMENTS: THE FLUME SHALL HAVE TWO 1/4" O.D. STAINLESS STEEL BUBBLE LINES AND ONE 3/8" O.D. STAINLESS STEEL SAMPLE LINE. THE TWO BUBBLE LINES PLUMBED TO THE SURFACE THROUGH THE 4" CONDUIT IN A MANNER THAT DOES NOT RESTRICT WORKING IN THE MANHOLE. PLEASE CALL THE DIVISION OF INDUSTRIAL WASTE AT 557-7012 FOR INSPECTION OF THE FLUME AND BUBBLE TUBE INSTALLATION."

A TWO OUTLET, GFCI, 110 VOLT, AC ELECTRICAL SUPPLY SHALL BE SUPPLIED FOR EXCLUSIVE USE BY MSD AT THE CONCRETE PAD, OR WITHIN FIFTY FEET SO THAT THE ROUTE OF AN EXTENSION CORD WILL NOT CROSS A TRAFFIC ZONE.

GENERAL AREA LIGHTING SHALL BE PROVIDED TO ILLUMINATE THE VICINITY OF THE METERING MANHOLE.



SECTION A-A

**NOTES:**

\*\*4" DIAMETER PVC CONDUIT, WITH THREADED ADAPTOR AND PLUG (CENTERED OVER THE INLET CHANNEL), SHALL EXTEND THROUGH THE MANHOLE SLAB TOP.

6' LONG, 4" I.D. CAST IRON PIPE GUARD POSTS SHALL BE INSTALLED, AS DIRECTED BY THE ENGINEER, TO PREVENT VEHICULAR DAMAGE TO THE METERING MANHOLE. GUARD POSTS SHALL BE FILLED WITH CONCRETE AND INSTALLED 4' DEEP.

PARKING SHALL BE PROVIDED WITHIN 100 FEET OF THE MANHOLE FOR TWO MSD CONFINED SPACE ENTRY SUPPORT VANS. THE ROUTE FROM PARKING TO THE MANHOLE, FOR BREATHING AIR LINES, SHALL NOT CROSS A TRAFFIC ZONE.

ALL LOCKING MECHANISMS SHALL UTILIZE DUAL LOCKS, ONE SUPPLIED BY MSD AND THE OTHER SUPPLIED BY THE OWNER.

ALL REINFORCING STEEL SHALL HAVE A MINIMUM COVER OF 2" BOTH FACES

JOINTS ON MANHOLE SECTIONS SHALL BE MADE WITH A RUBBER GASKET MEETING THE REQUIREMENT OF ASTM C-443, EXCEPT THAT ONLY "O" RING AND PROFILE GASKETS ARE ACCEPTABLE.

LIFT HOLES IN MANHOLES TO BE SEALED WITH HYDRAULIC CEMENT.

1' PRECAST MANHOLE SECTION TO BE SET WHEN MANHOLE TOP IS POURED.

ALL OTHER CHARACTERISTICS ARE SIMILAR TO STANDARD MANHOLES.

ALL CONCRETE SHALL BE CLASS "C".

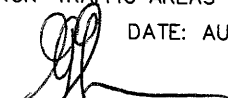
PRECAST CONCRETE BARRELS SHALL BE IN ACCORDANCE WITH ITEM 706.13 OF THE SPECIFICATIONS.

THE  
METROPOLITAN SEWER DISTRICT  
OF  
GREATER CINCINNATI  
**STANDARD TYPE "C"**  
**SAMPLING & GAUGING MANHOLE**  
(FOR USE IN NON-TRAFFIC AREAS ONLY)

NO SCALE

DATE: AUG., 2006

APPROVED:

  
SEWERS CHIEF ENGINEER

ACC. NO. 49059-C

**NOTES:**

FOR USE IN TRAFFIC AREAS ONLY.

AN ALUMINUM 3'-6" SQUARE SINGLE LEAF HINGED DOOR (BILCO H20, OR EQUAL) SHALL BE INSTALLED IN THE MANHOLE SLAB TOP. THE HINGED SIDE OF THE SQUARE LID IS TO BE ORIENTED PARALLEL TO THE DOWNSTREAM FLOW DIRECTION.

DOWNSTREAM CONDUIT SLOPE SHALL BE GREATER THAN OR EQUAL TO UPSTREAM CONDUIT SLOPE WITH NO OBSTRUCTION WITHIN TEN PIPE DIAMETERS DOWNSTREAM OF THE CENTER OF THE MANHOLE.

NO BENDS, DROP MANHOLES, FLOW JUNCTIONS, ETC., SHALL BE LOCATED WITHIN 25 PIPE DIAMETERS UPSTREAM OF THE CENTER OF THE MANHOLE.

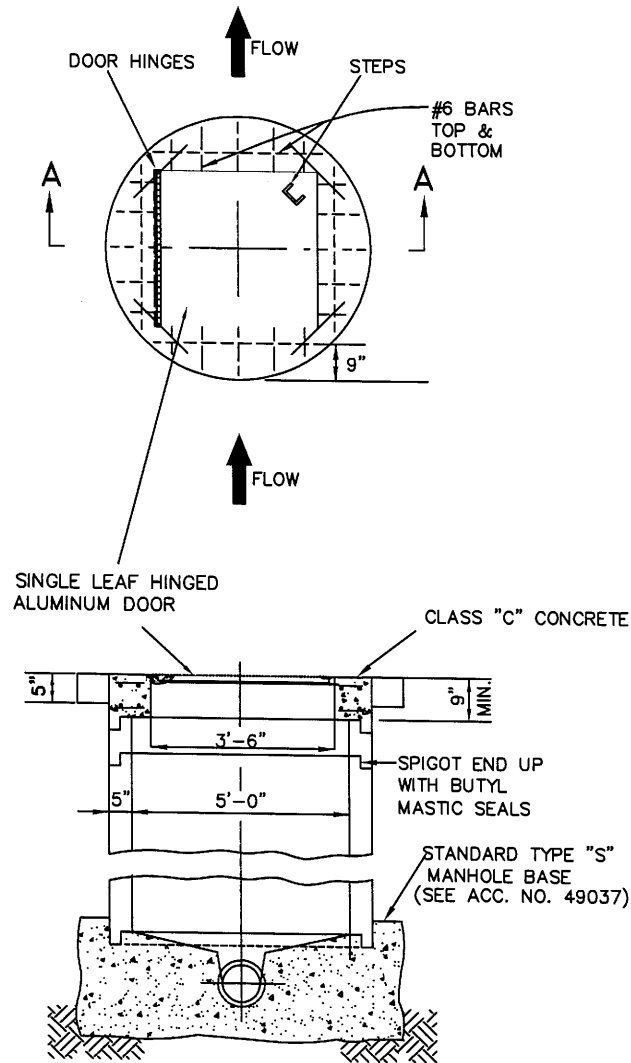
ALLOWABLE CONDUIT SLOPE ENTERING AND EXITING THE MANHOLE SHALL BE LIMITED TO A SPECIFIC MAXIMUM AND MINIMUM AS PER THE FOLLOWING TABLE:

PIPE SIZE	MIN. % SLOPE	MAX. % SLOPE
6"	2.00	2.2
8"	0.70	2.0
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12"	0.40	1.6
15"	0.30	1.5
18"	0.24	1.4
21"	0.19	1.4

\* 10" CONDUIT NOT APPROVED FOR NEW INSTALLATIONS

STEPS IN THE BARREL SECTION OF THE PRE-CAST MANHOLE ARE TO BE INSTALLED IN ALIGNMENT WITH THE DOWNSTREAM CORNER OF THE SQUARE LID ON THE OPPOSITE SIDE FROM THE LID HINGE.

IN A TRAFFIC AREA, THE SLAB COVER MUST BE SLIGHTLY RAISED ABOVE THE SURROUNDING AREA TO PREVENT INFILTRATION OF STORMWATER.



SECTION A-A

**NOTES:**

ALL REINFORCING STEEL SHALL HAVE A MINIMUM COVER OF 2" BOTH FACES

JOINTS ON MANHOLE SECTIONS SHALL BE MADE WITH A RUBBER GASKET MEETING THE REQUIREMENT OF ASTM C-443, EXCEPT THAT ONLY "O" RING AND PROFILE GASKETS ARE ACCEPTABLE.

LIFT HOLES IN MANHOLES TO BE SEALED WITH HYDRAULIC CEMENT.

1' PRECAST MANHOLE SECTION TO BE SET WHEN MANHOLE TOP IS POURED.

ALL OTHER CHARACTERISTICS ARE SIMILAR TO STANDARD MANHOLES.

ALL CONCRETE SHALL BE CLASS "C".

PRECAST CONCRETE BARRELS SHALL BE IN ACCORDANCE WITH ITEM 706.13 OF THE SPECIFICATIONS.

THE  
METROPOLITAN SEWER DISTRICT  
OF  
GREATER CINCINNATI  
**STANDARD TYPE "D"**  
**SAMPLING & GAUGING MANHOLE**  
(FOR USE IN TRAFFIC AREAS ONLY)

NO SCALE

DATE: AUG., 2006

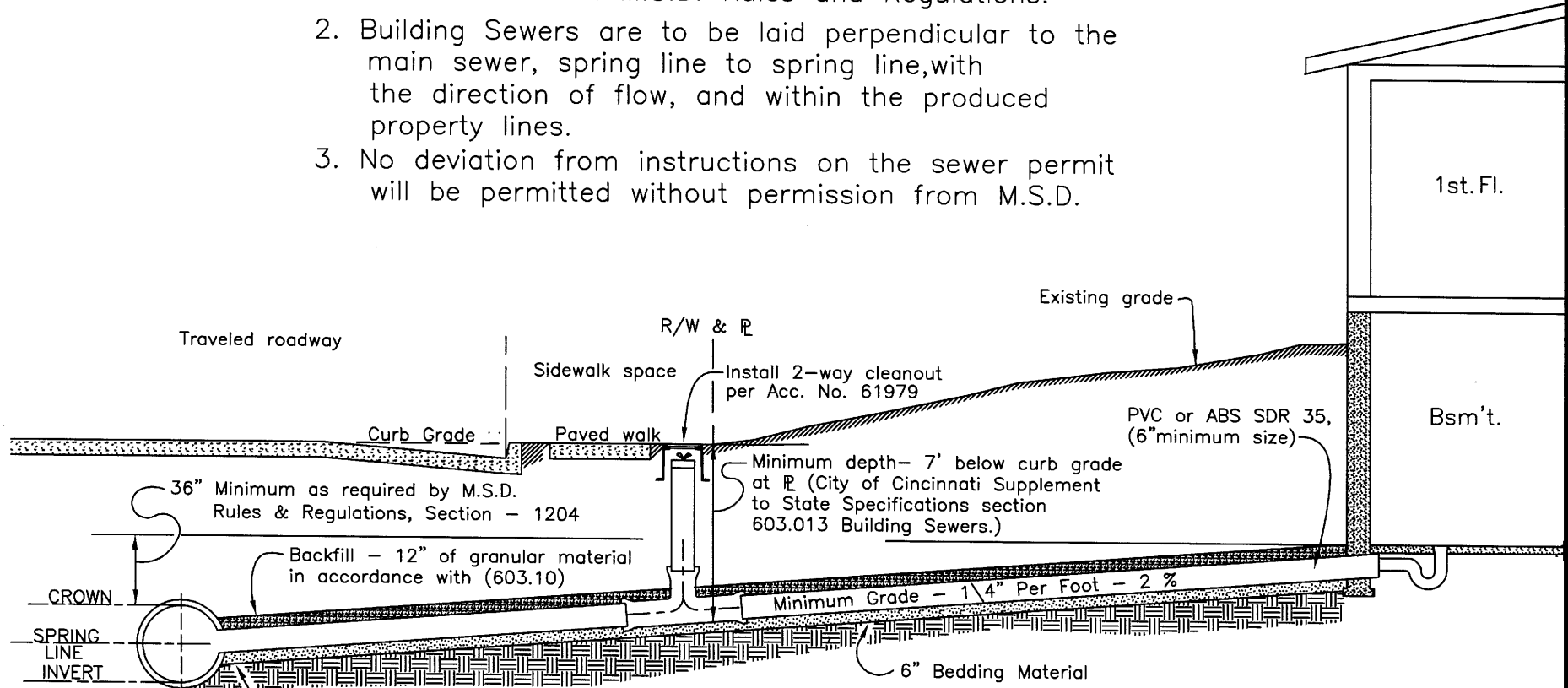
APPROVED:

SEWERS CHIEF ENGINEER



## INSTRUCTIONS

1. Installation of Building Sewers shall be done in accordance with M.S.D. Rules and Regulations.
2. Building Sewers are to be laid perpendicular to the main sewer, spring line to spring line, with the direction of flow, and within the produced property lines.
3. No deviation from instructions on the sewer permit will be permitted without permission from M.S.D.

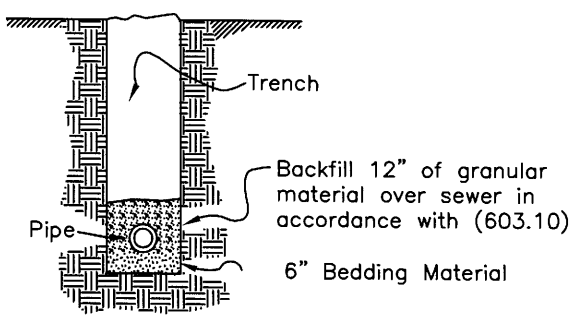


SEE ACC NO. 49033 for Connection and/or stack detail.

SEE ACC. NO. 49053 for Connection to a Brick Sewer.

All fittings used for 6" PVC or ABS pipe connections shall be Wye only fittings for new main line conduits.

Approved tapping saddles may be used for existing main line connections.

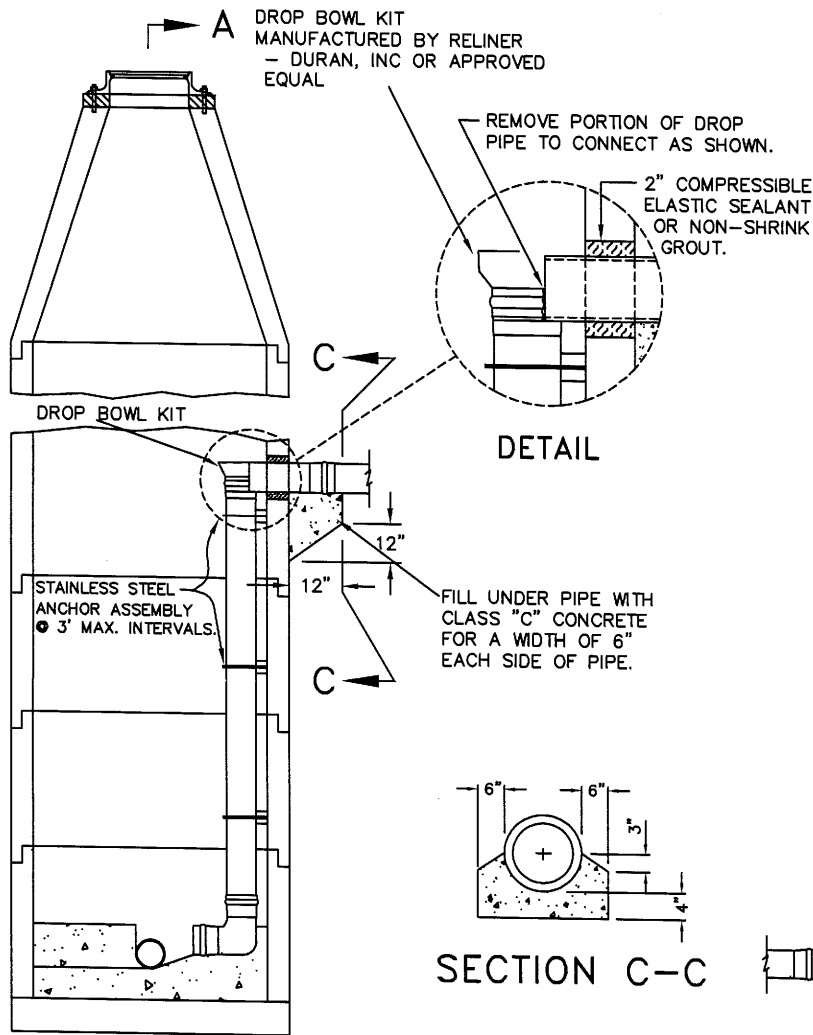


THE  
METROPOLITAN SEWER DISTRICT  
OF  
GREATER CINCINNATI

**TYPICAL INSTALLATION  
OF BUILDING SEWER LATERAL**

NO SCALE                      DATE: AUG. 2011

APPROVED: *Ralph J. Johnston*  
SEWERS CHIEF ENGINEER



**NOTES:**


INSIDE DROP MANHOLES SHALL ONLY BE USED WHERE APPROVED BY M.S.D.  
 REMODEL BOTTOM OF EXISTING MANHOLE IN THE DIRECTION OF FLOW.  
 ALL CONCRETE SHALL BE CLASS "C".

INSIDE DROP CONNECTIONS ON SANITARY SEWERS	
CONDUIT SIZE	STACK SIZE
8"	8"
12"	12"

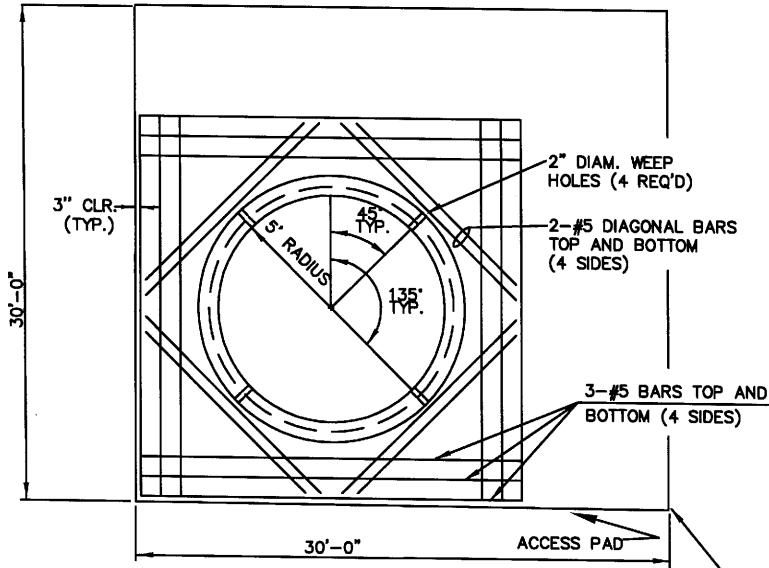
SECTION A-A

SECTION C-C

S.N.

THE  
 METROPOLITAN SEWER DISTRICT  
 OF  
 GREATER CINCINNATI  
**STANDARD**  
**INSIDE DROP FOR**  
**EXISTING MANHOLE**  
 NO SCALE DATE: AUG., 2006  
 APPROVED:  SEWERS CHIEF ENGINEER

ACC. NO. 49061



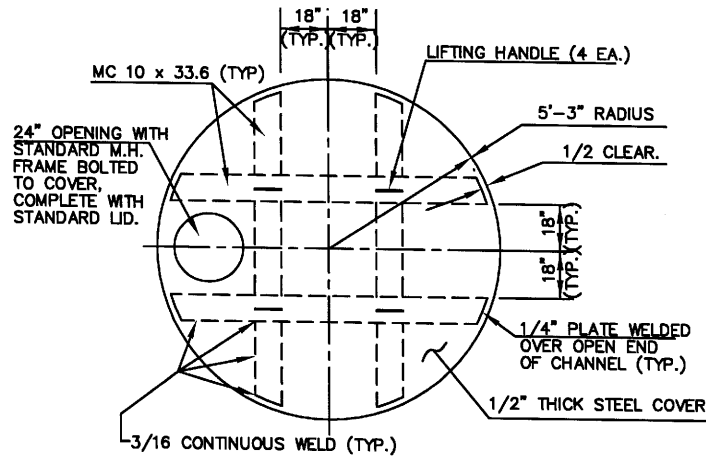
**GRIT CHAMBER DRAINAGE & ACCESS PAD DETAIL**

THE DRAINAGE PAD SHALL BE CONTAINED IN ONE CORNER OF A 30' x 30' CONCRETE ACCESS PAD

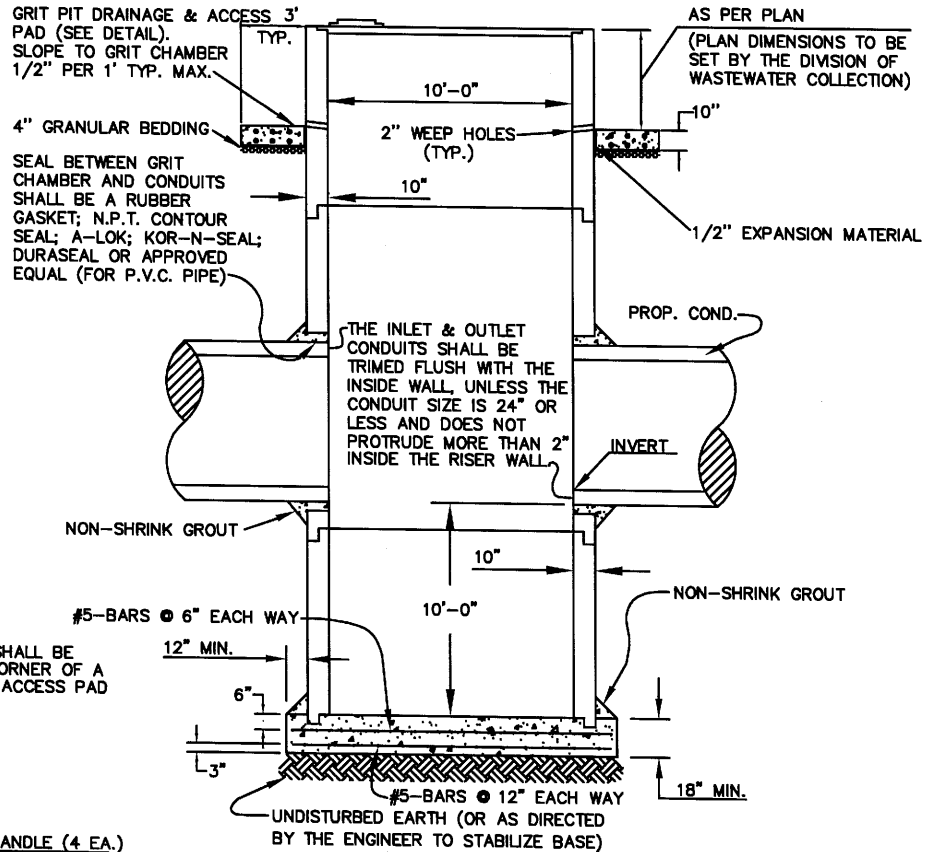
**NOTES:**

PROPOSED GRIT CHAMBER SHALL BE CONSTRUCTED USING 120" DIAMETER, 706.02, CL. III PIPE WITH 706.11 JOINTS.

ALL CONCRETE SHALL BE CLASS "C".



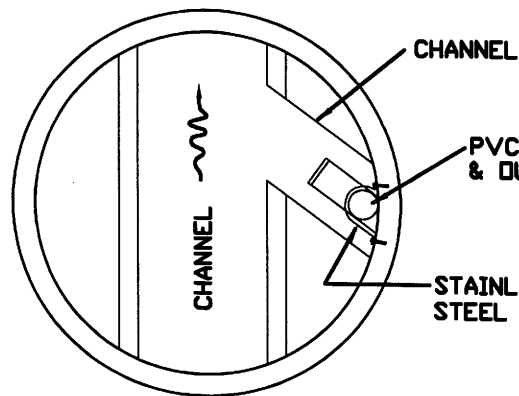
**COVER PLATE ASSEMBLY  
TO BE SUPPLIED BY CONTRACTOR**



**GRIT CHAMBER**

THE  
METROPOLITAN SEWER DISTRICT  
OF  
GREATER CINCINNATI  
**STANDARD  
GRIT  
CHAMBER**

NO SCALE DATE JAN. 2008  
APPROVED: *Thomas A. Schuers*  
**INTERIM** SEWERS CHIEF ENGINEER



**SECTION A-A**

FRAME & COVER

**NOTES:**

ALL FEATURES NOT NOTED, TO BE THE SAME AS SHOWN ON ACC. NO. 49037 FOR STANDARD TYPE 'S' MANHOLES.

LOW PRESSURE FORCE MAINS SHALL NOT DISCHARGE INTO HEAD END MANHOLES. THE DISCHARGE POINT SHALL BE LOCATED DOWNSTREAM OF A MINIMUM OF THREE ACTIVE BUILDING CONNECTIONS.

VENT RISER  
(1-2 FT.)

REMOVABLE MECHANICAL JOINT CAP

RUBBER GASKET

LOW PRESSURE SEWER SYSTEM

PVC CROSS

18" MAX.

18" MAX.

A

A

PVC STACK TO BE THE SAME SIZE AS THE FORCE MAIN

FASTEN STACK SECURELY TO MH. WALL WITH STAINLESS STEEL HARDWARE, MAX. 4' INTERVAL.  
STRAPS - 2" WIDE, 1/4" THICK  
STRAP BOLTS - 3/8" DIAM., 2 1/4" LONG (ANCHORS, PER SECTION A-A, MAY BE BULL DOG, RED HEAD, WEDGE IT OR QUICK BOLT.)

90° PVC TURN TO DIRECT FLOW DOWNSTREAM (CHANNEL BENCH IN DIRECTION OF FLOW)

UNDISTURBED EARTH

THE METROPOLITAN SEWER DISTRICT OF GREATER CINCINNATI

LOW PRESSURE FORCE MAIN TYPICAL RECEIVING MANHOLE

NO SCALE

DATE: AUGUST 1994

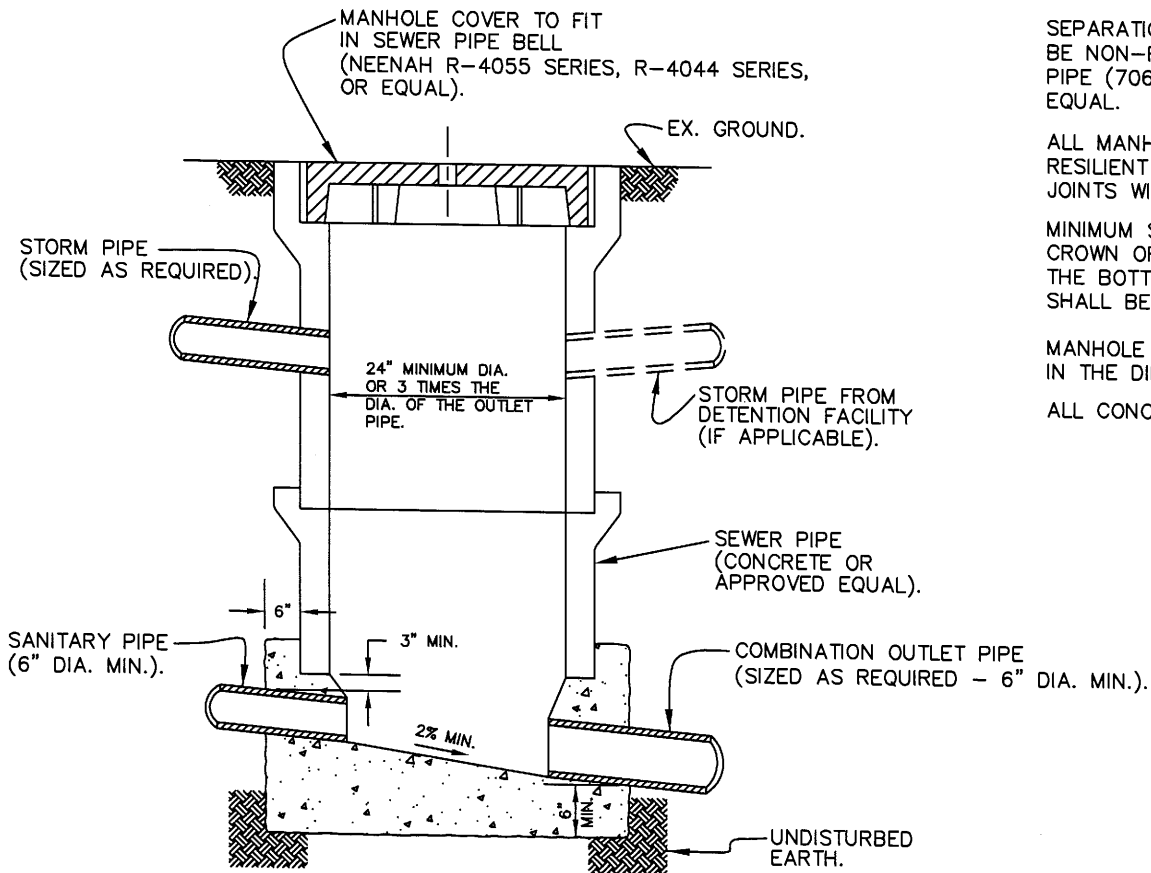
APPROVED:

*Edward H. Kuttman*  
SEWERS CHIEF ENGINEER

**TYP. RECEIVING MANHOLE**

REV.  
REV.

ACC. NO. 49063



NOTES:

SEPARATION MANHOLE SHALL BE LOCATED WITHIN 5 TO 10 FEET OF THE PROPERTY LINE.

SEPARATION MANHOLE PIPE SHALL BE NON-REINFORCED CONCRETE PIPE (706.01) OR AN APPROVED EQUAL.

ALL MANHOLE JOINTS SHALL BE RESILIENT AND FLEXIBLE GASKET JOINTS WITH BUTYL MASTIC SEALS.

MINIMUM SEPARATION BETWEEN THE CROWN OF THE SANITARY PIPE AND THE BOTTOM OF THE STORM PIPE SHALL BE 6".

MANHOLE BOTTOM SHALL BE CHanneled IN THE DIRECTION OF THE FLOW.

ALL CONCRETE SHALL BE CLASS "C".

THE  
METROPOLITAN SEWER DISTRICT  
OF  
GREATER CINCINNATI  
**STANDARD**  
**SEPARATION MANHOLE**

NO SCALE

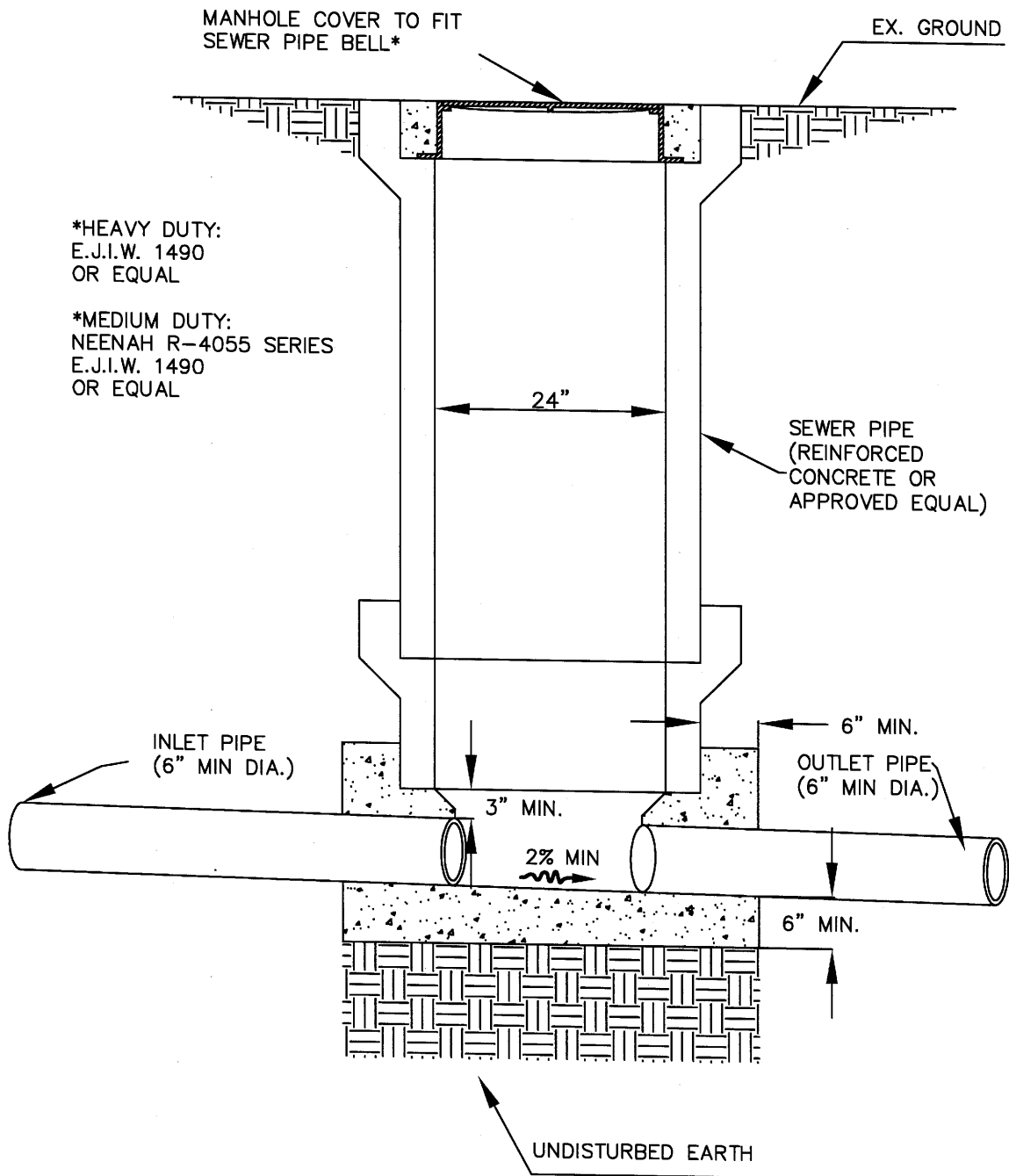
DATE: AUG., 2006

APPROVED:

*[Signature]*  
SEWERS CHIEF ENGINEER

S.N.

ACC. NO. 49067



\*HEAVY DUTY:  
E.J.I.W. 1490  
OR EQUAL

\*MEDIUM DUTY:  
NEENAH R-4055 SERIES  
E.J.I.W. 1490  
OR EQUAL

NOTES:

MONITORING MANHOLE SHALL BE LOCATED WITHIN 5 TO 10 FEET OF THE PROPERTY LINE.

MONITORING MANHOLE PIPE SHALL BE REINFORCED CONCRETE PIPE (706.02) OR AN APPROVED EQUAL.

ALL MANHOLE JOINTS SHALL BE RESILIENT AND FLEXIBLE GASKET JOINTS WITH BUTYL MASTIC SEALS.

MANHOLE BOTTOM SHALL BE CHanneled IN THE DIRECTION OF FLOW.

ALL CONCRETE SHALL BE CLASS C.

HEAVY DUTY CASTINGS SHALL BE REQUIRED IN ALL TRAFFIC AREAS.

MEDIUM DUTY CASTINGS MAY BE USED FOR DRIVEWAYS, PARKING LOTS AND NON-TRAFFIC AREAS WHERE LOADS WILL NOT EXCEED 2,000 LBS.

PIPE BELL SIZES FREQUENTLY VARY FROM DIFFERENT MANUFACTURERS. CASTING DIMENSIONS SHOULD BE CHECKED TO MAKE SURE THE CASTING WILL FIT IN THE SELECTED PIPE BELL.

ALL MANHOLE COVERS SHALL HAVE VENTED LIDS WITH A LIFT HOLE.

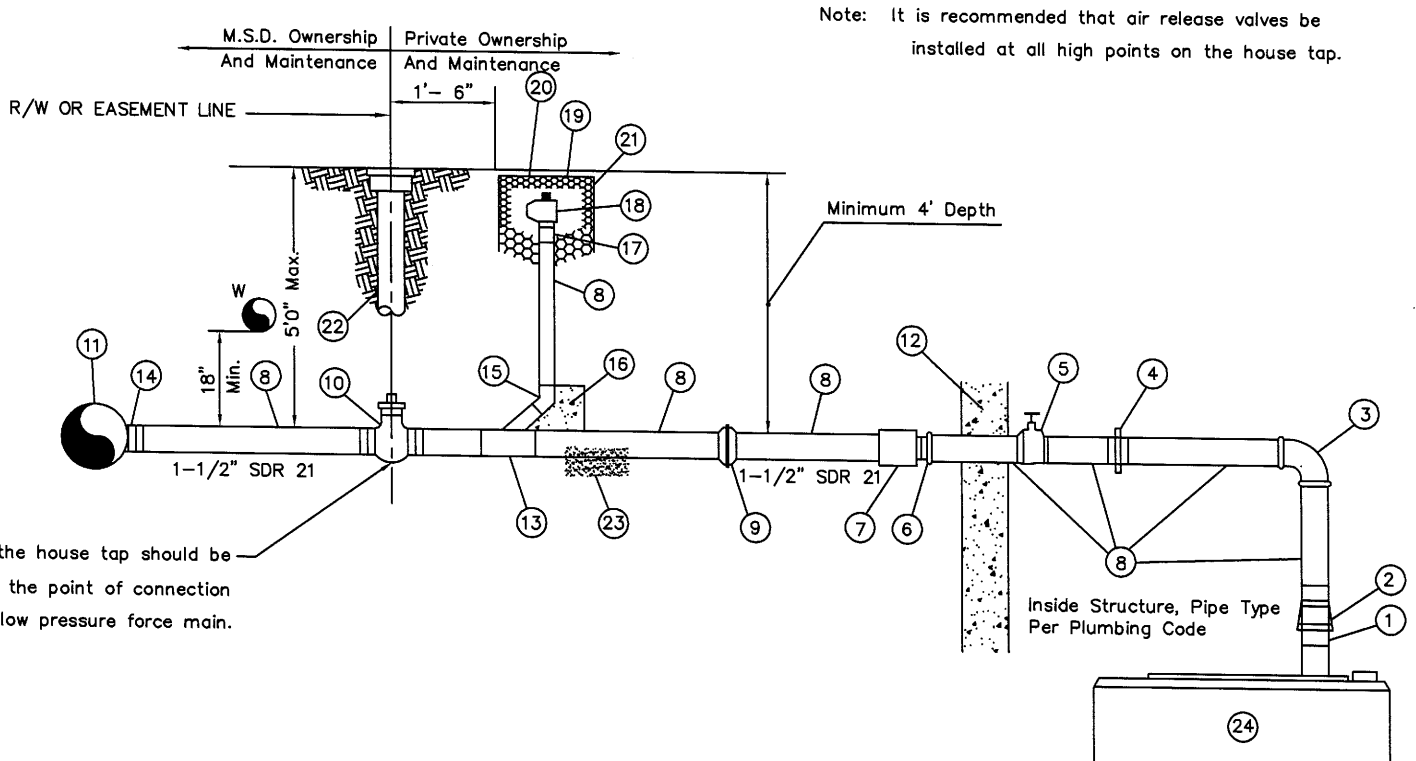
THE  
METROPOLITAN SEWER DISTRICT  
OF  
GREATER CINCINNATI  
**STANDARD  
MONITORING MANHOLE**

NO SCALE DATE: JULY 2007  
APPROVED: *Darryl A. Regel*  
SEWERS CHIEF ENGINEER

RMK

REV.  
REV.

ACC. NO. 49068



Note: It is recommended that air release valves be installed at all high points on the house tap.

This point of the house tap should be 6" lower than the point of connection to the public low pressure force main.

- |   |  |   |
|---|--|---|
| <ul style="list-style-type: none"> <li>① Grinder Pump Discharge - 1 1/2" NPT</li> <li>② Adapter - 1 1/2" FPT x 1 1/2" Sweat Copper</li> <li>③ Elbow 90° 1 1/2" Sweat Copper (NIBCO 607 or Equiv.)</li> <li>④ Disconnect Joint - 1 1/2" Union or Compression Type Coupling</li> <li>⑤ Valve - 1 1/2" Fully Ported (Gate, Ball, Valve, etc.)</li> <li>⑥ Adapter - 1 1/2" NPT x Sweat Copper (NIBCO 604 or Equiv.)</li> <li>⑦ Adapter - 1 1/2" FPT x 1 1/2" Socket PVC</li> <li>⑧ Pipe - 1 1/2" PVC W/Gasket Joints (160 P.S.I. Minimum)</li> <li>⑨ Check Valve - 1 1/2" Fully Ported Swing Type</li> <li>⑩ Stop 1 1/2" NPT, Brass (N\A)</li> <li>⑪ Low Pressure Main</li> </ul> | <ul style="list-style-type: none"> <li>⑫ Foundation Wall</li> <li>⑬ 1 1/2" x 1 1/2" Wye PVC</li> <li>⑭ Wye 2" x 2" w/ 2" x 1 1/2" Adapter For Tap</li> <li>⑮ Elbow - 45°, 1 1/2" PVC</li> <li>⑯ Concrete Thrust Block</li> <li>⑰ Threaded Adapter</li> <li>⑱ 1 1/2" Gate Valve - Wrench Operated (Sears or Equal) W/Threaded Flushing Adapter</li> </ul> | <ul style="list-style-type: none"> <li>⑲ Insulation</li> <li>⑳ Cover - Concrete, Steel, etc.: Weatherproof, Vandalproof</li> <li>㉑ Meter Box</li> <li>㉒ Stop Box - Ametek Roadway Valve Box or approved equal. Lid shall be labeled "SEWER".</li> <li>㉓ Gravel Bedding</li> <li>㉔ Grinder Pump</li> </ul> |
|---|--|---|


THE  
 METROPOLITAN SEWER DISTRICT  
 OF  
 GREATER CINCINNATI  
**STANDARD BUILDING  
 CONNECTION TO A LOW  
 PRESSURE FORCE MAIN**

NO SCALE DATE: AUG., 2006  
 APPROVED: SEWERS CHIEF ENGINEER

ACC. NO. 49069

# STANDARD SYMBOLS

ITEM	SYMBOL
COUNTY LINE	--- (HAMILTON COUNTY) --- (BUTLER COUNTY)
TOWNSHIP LINE	--- (MIAMI TOWNSHIP) --- (GREEN TOWNSHIP)
CORPORATION LINE	--- (CITY OF CINCINNATI) --- (COUNTY OF HAMILTON, AMBERLY VILLAGE, ETC.)
SECTION LINE	--- (SECTION 25) --- (SECTION 24)
EXISTING FENCE LINE	X X EX. FENCE
EXISTING WALL	EX. WALL
EXISTING E.O.P. (CURB LINE)	--- CURB LINE
EXISTING WALK	--- EX. CONC. WALK
EXISTING DRIVE	---
LIMITED ACCESS LINE	--- L/A
EXISTING R-O-W LINE	--- R/W
PROPERTY LINE	--- P
LIMITS OF CONSTRUCTION	--- LIMITS OF CONSTRUCTION
EX. RAILROAD	40 scale and larger Less than 40 scale
EXISTING CABLE TV LINE	--- C --- C --- C
EXISTING ELECTRIC LINE	--- E --- E --- E
EXISTING GAS LINE	EX. " G.M. --- G --- G
EXISTING TELEPHONE LINE	--- T --- T --- T
EXISTING WATER LINE	EX. " W.M. --- V --- V

THE METROPOLITAN SEWER DISTRICT  
OF GREATER CINCINNATI  
**STANDARD SYMBOLS**  
NO SCALE DATE: AUG., 2006  
APPROVED:  SEWERS CHIEF ENGINEER


ACC. NO. 49072

# STANDARD SYMBOLS

ITEM	SYMBOL
EXISTING GUARD RAIL	
EX. SEWER (24" AND LARGER)	
EX. SEWER (UP TO 24")	
PROP. SEWER (24" AND LARGER)	
PROP. SEWER (UP TO 24")	
PROP. SEWER (24" AND LARGER) IN SAME ALIGNMENT AS EXISTING	
PROP. SEWER (UP TO 24") IN SAME ALIGNMENT AS EXISTING	

ITEM	PLAN	PROFILE
CONCRETE ENCASEMENT		
TUNNEL OR PIPE JACKING		
JACK & BORE OR DIRECTIONAL DRILL		


ITEM	SYMBOL
EXISTING CONTOUR	
GROUND PROFILE	

THE METROPOLITAN SEWER DISTRICT  
OF GREATER CINCINNATI  
**STANDARD SYMBOLS**  
NO SCALE DATE: AUG., 2006  
APPROVED:  SEWERS CHIEF ENGINEER

ACC. NO. 49073




















# STANDARD SYMBOLS


ITEM	SYMBOL	DWG
BAR SCALE		MSDSCALE
NORTH ARROW		MSDNARR
EXISTING BENCHMARK		MSDBM
PROPERTY LINE		MSDPL
COMMON PROPERTY LINE		MSDM_PL
LIMITED ACCESS R/W		MSDLA
RIGHT OF WAY		MSDRW
EXISTING SIGN		MSDEXSGN
EXISTING MAIL BOX		MSDMAILBOX
EXISTING MARSH		MSDMARSH
EXISTING FLOW ARROW		MSDEXARROW
PROPOSED FLOW ARROW		MSDPRARROW
TEST BORE		MSDTBOR
EXISTING FLAG POLE		MSDFPOLE
EXISTING LIGHT POLE		MSDLPOLE
EXISTING POWER POLE		MSDPPOLE
EXISTING GUY WIRE		MSDGUY
EXISTING TELEPHONE POLE		MSDTPOLE
EXISTING TELEPHONE MANHOLE		MSDTMH

THE METROPOLITAN SEWER DISTRICT  
 OF GREATER CINCINNATI  
**STANDARD SYMBOLS**  
 NO SCALE DATE: AUG., 2006  
 APPROVED:  SEWERS CHIEF ENGINEER

ACC. NO. 49074

# STANDARD SYMBOLS

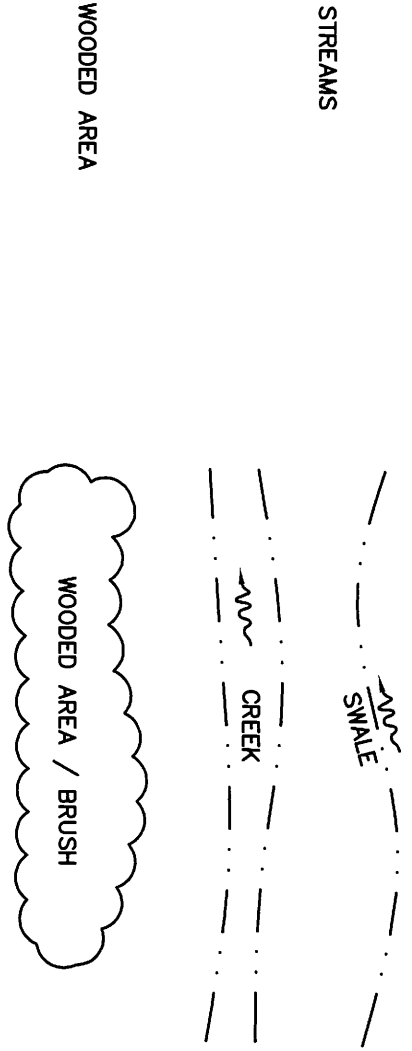
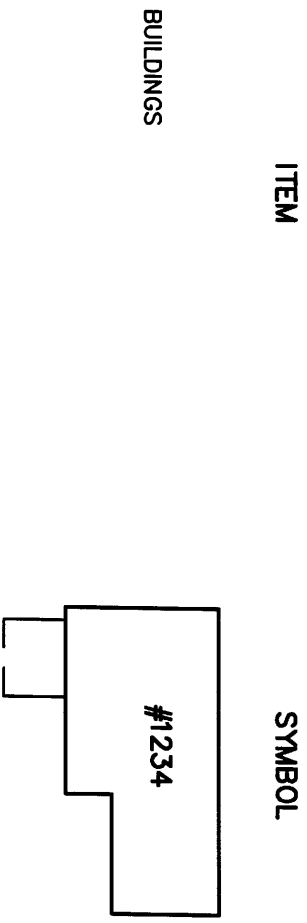
ITEM	SYMBOL	DWG
EXISTING COMBINATION INLET		MSDCOMBI
EXISTING CURB INLET		MSDCURBI
EXISTING CURB INLET MANHOLE		MSDCURBI MH
EXISTING DOUBLE DITCH INLET		MSDDDI
EXISTING DOUBLE GUTTER INLET		MSDDGI
EXISTING SINGLE DITCH INLET		MSDDSI
EXISTING SINGLE GUTTER INLET		MSDDSI
EXISTING YARD DRAIN		MSDYD
EXISTING GAS BOX		MSDGB
EXISTING GAS VALVE		MSDGV
EXISTING WATER BOX		MSDWB
EXISTING WATER VALVE CHAMBER		MSDWCM
EXISTING WATER VALVE		MSDWV
EXISTING FIRE HYDRANT		MSDEXFH
EXISTING MANHOLE		MSDEXMH
PROPOSED MANHOLE		MSDPRMH
PROPOSED MANHOLE OVER EXISTING MANHOLE		MSDPREX
EXISTING CLEAN-OUT		MSDECLOUT
PROPOSED CLEAN-OUT		MSDCLOUT

THE METROPOLITAN SEWER DISTRICT  
OF GREATER CINCINNATI  
STANDARD SYMBOLS  
NO SCALE DATE: AUG., 2006  
APPROVED:  SEWERS CHIEF ENGINEER

ACC. NO. 49075

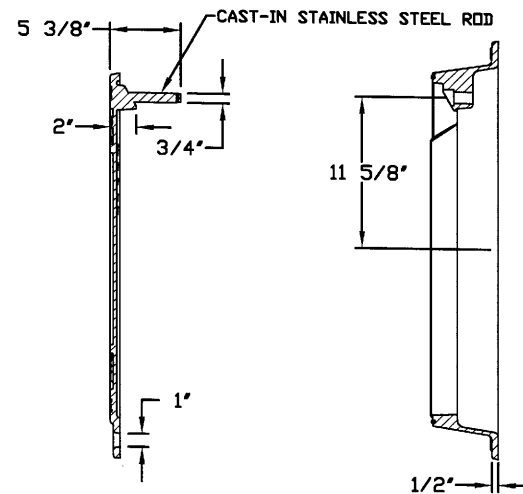
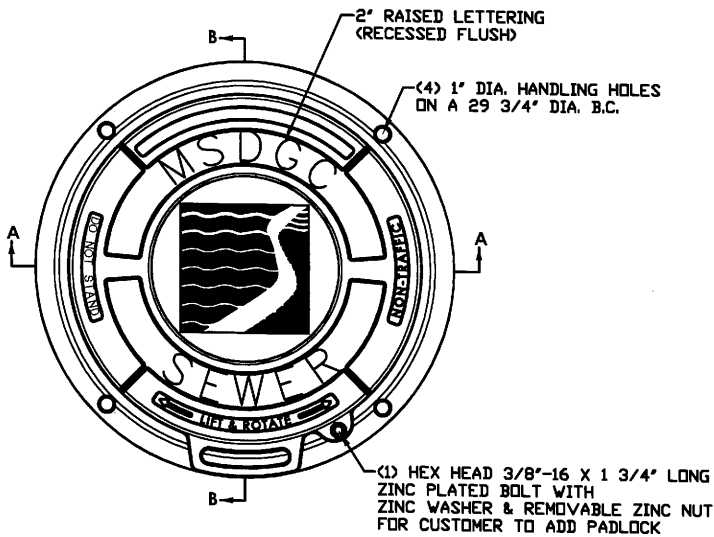
# STANDARD SYMBOLS

ITEM	SYMBOL	DWG
LABEL TREE SIZE AND DRAW TO SCALE WHEN APPLICABLE		
DECIDUOUS TREE 1" - 12"		tree1
DECIDUOUS TREE 13" - 20"		tree2
DECIDUOUS TREE 21" - 35"		tree3
DECIDUOUS TREE 36" AND UP		tree4
EVERGREEN TREE 1" - 12"		etree1
EVERGREEN TREE 13" - 20"		etree2
EVERGREEN TREE 21" - 35"		etree3
EVERGREEN TREE 36" AND UP		etree4

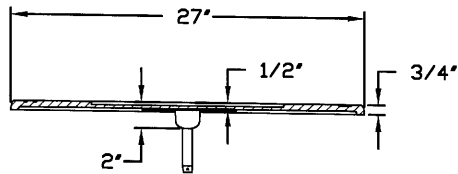


THE METROPOLITAN SEWER DISTRICT  
OF GREATER CINCINNATI  
**STANDARD SYMBOLS**  
NO SCALE DATE: AUG. 2006  
APPROVED: SEWERS CHIEF ENGINEER

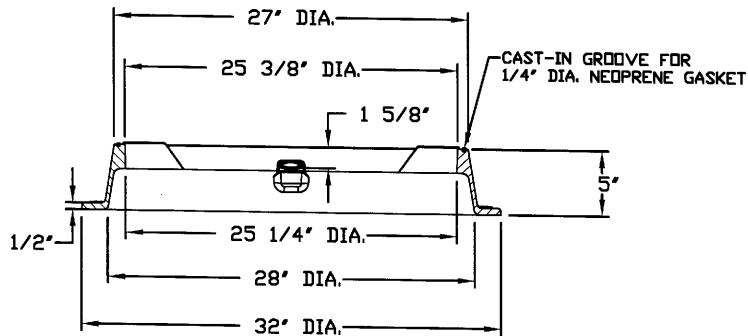
ACC. NO. 49076



COVER SECTION B-B FRAME SECTION B-B



COVER SECTION A-A



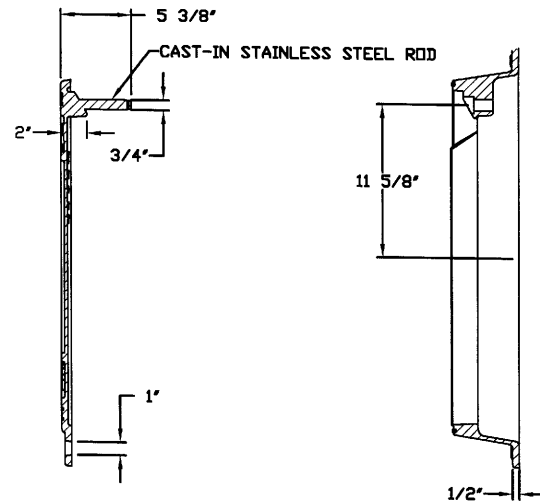
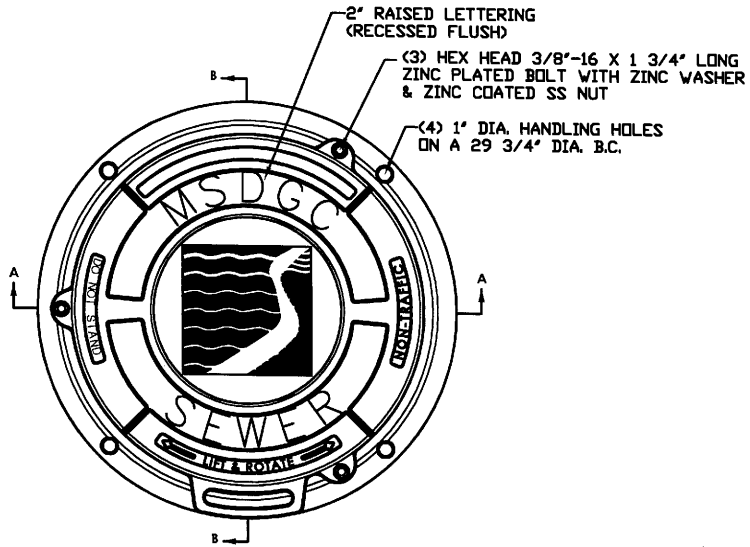
FRAME SECTION A-A

NOTES:

- THIS COVER SHALL ONLY BE USED WHERE SPECIFIED ON THE PLANS.
- NON-TRAFFIC USE ONLY.
- ESTIMATED WEIGHTS:
  - FRAME 85 LBS
  - COVER 60 LBS
  - TOTAL 145 LBS
- FRAME & COVER MATERIAL: CAST GRAY IRON ASTM A48, CLASS 35B
- SPEC. EAST JORDAN 10401R01 OR EQUAL. THERE IS NO GUARANTEE THAT AN EQUAL IS AVAILABLE.

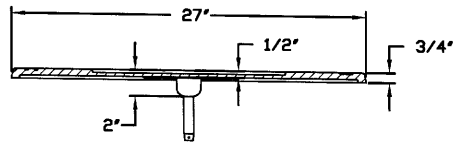
THE  
METROPOLITAN SEWER DISTRICT  
OF  
GREATER CINCINNATI  
STANDARD MANHOLE  
COVER ON  
ELEVATED CONES

NO SCALE DATE: MAY 2008  
APPROVED: *Thomas W. Schwens*  
INTERIM SEWERS CHIEF ENGINEER



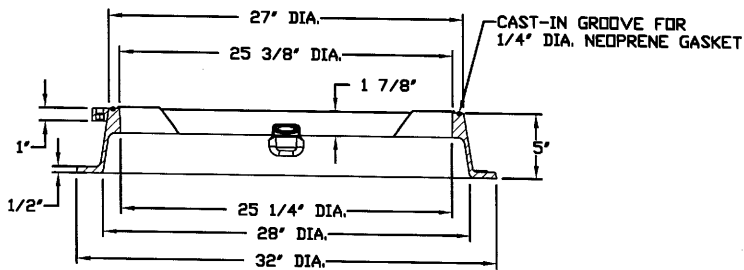
COVER SECTION B-B

FRAME SECTION B-B



COVER SECTION A-A

- NOTES:
- THIS COVER SHALL ONLY BE USED WHERE SPECIFIED ON THE PLANS.
  - NON-TRAFFIC USE ONLY.
  - ESTIMATED WEIGHTS:
    - FRAME 85 LBS
    - COVER 60 LBS
    - TOTAL 145 LBS
  - FRAME & COVER MATERIAL: CAST GRAY IRON ASTM A48, CLASS 35B
  - SPEC. EAST JORDAN 104010R01 OR EQUAL. THERE IS NO GUARANTEE THAT AN EQUAL IS AVAILABLE.

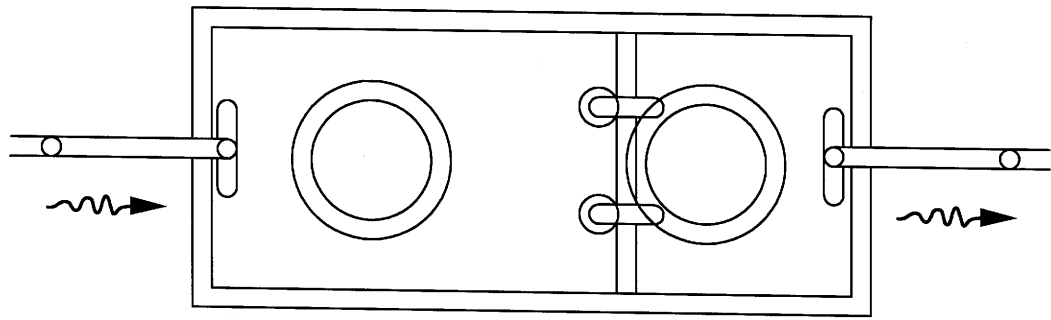


FRAME SECTION A-A

THE  
METROPOLITAN SEWER DISTRICT  
OF  
GREATER CINCINNATI  
STANDARD WATERTIGHT  
MANHOLE COVER ON  
ELEVATED CONES

NO SCALE DATE: MAY 2008  
APPROVED: *Thomas J. DeWaters*  
INTERIM SEWERS CHIEF ENGINEER

DFUs	VOLUME IN GALLONS
8	500
35	1000
172	1500
216	2000
342	3000



MSD DOES NOT REQUIRE OR PREFER BOLT-DOWN LIDS.  
 MSD STANDARD MANHOLE COVER WITH  
 MSD LOGO PER ACC #49005  
 (TYP)

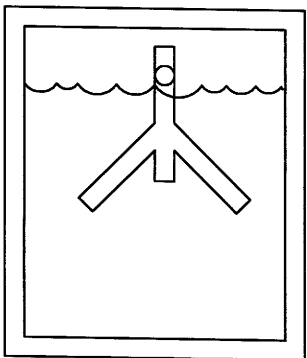
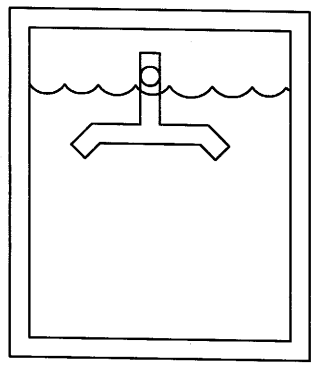
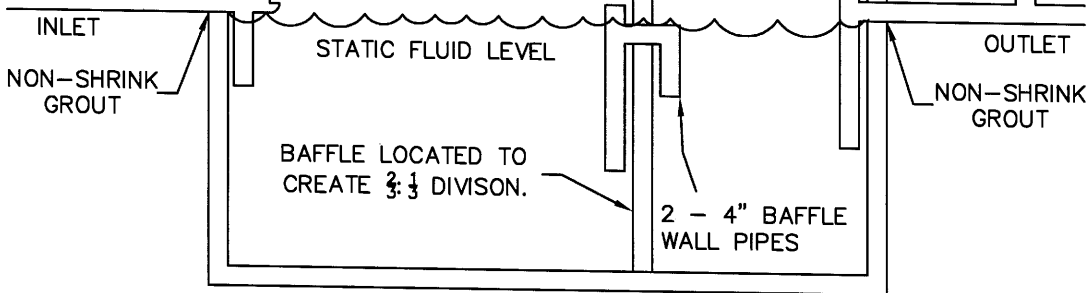
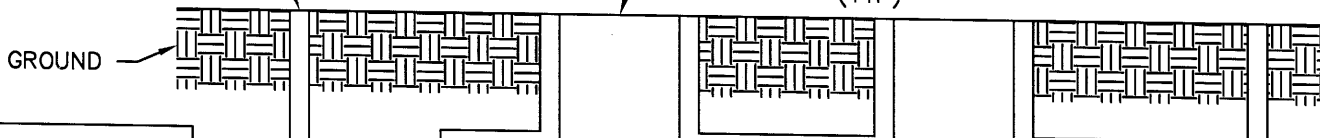
NOTES:  
 ALL CONCRETE IS MINIMUM 4500  
 PSI @ 28 DAYS REINFORCED WITH  
 6X6 (10GAX10GA) WELDED WIRE  
 MESH AND #3 REINFORCING BARS.

EXCAVATION FOR TANK MUST BE  
 COMPLETELY LEVEL AND FREE OF  
 ROCKS OR DEBRIS. PROVIDE 1-2  
 INCHES OF GRAVEL TO LEVEL THE  
 HOLE.

INLET & OUTLET OPENINGS ARE  
 PROVIDED WITH ADJUSTABLE SIZE  
 NEOPRENE GASKETS 3" - 4"  
 (POLYLOCK PIPE SEAL).

ALL INTERNAL PIPING IS 4".

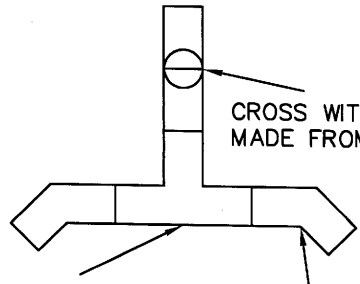
TWO WAY CLEANOUT  
 (TYP)



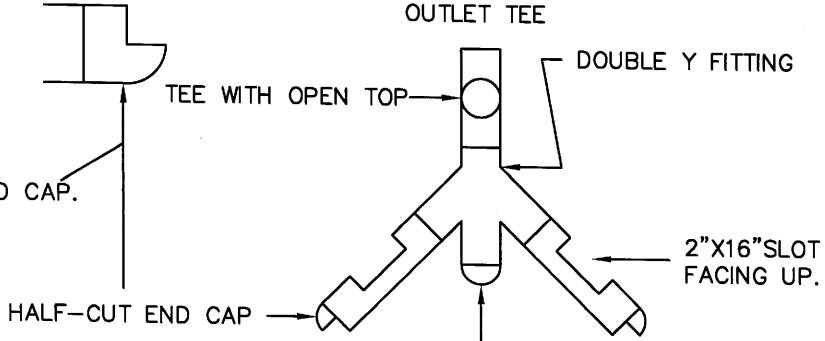
DOUBLE SWEEP  
 INLET TEE.

OUTLET TEE

OUTLET TEE AND  
 SAMPLE COLLECTION.



CROSS WITH OVERFLOW  
 MADE FROM HALF-CUT END CAP.



2"X16" SLOT  
 FACING UP.

TEE (DUAL SWEEP).  
 POSITION 14" - 18"  
 BELOW STATIC FLUID LEVEL.

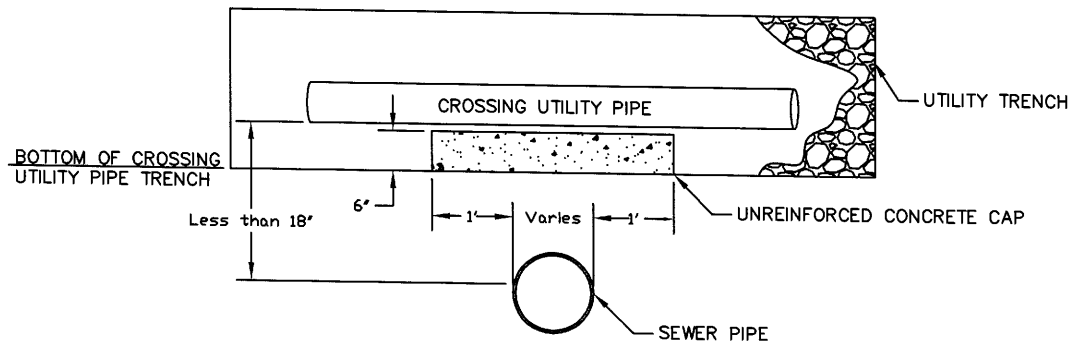
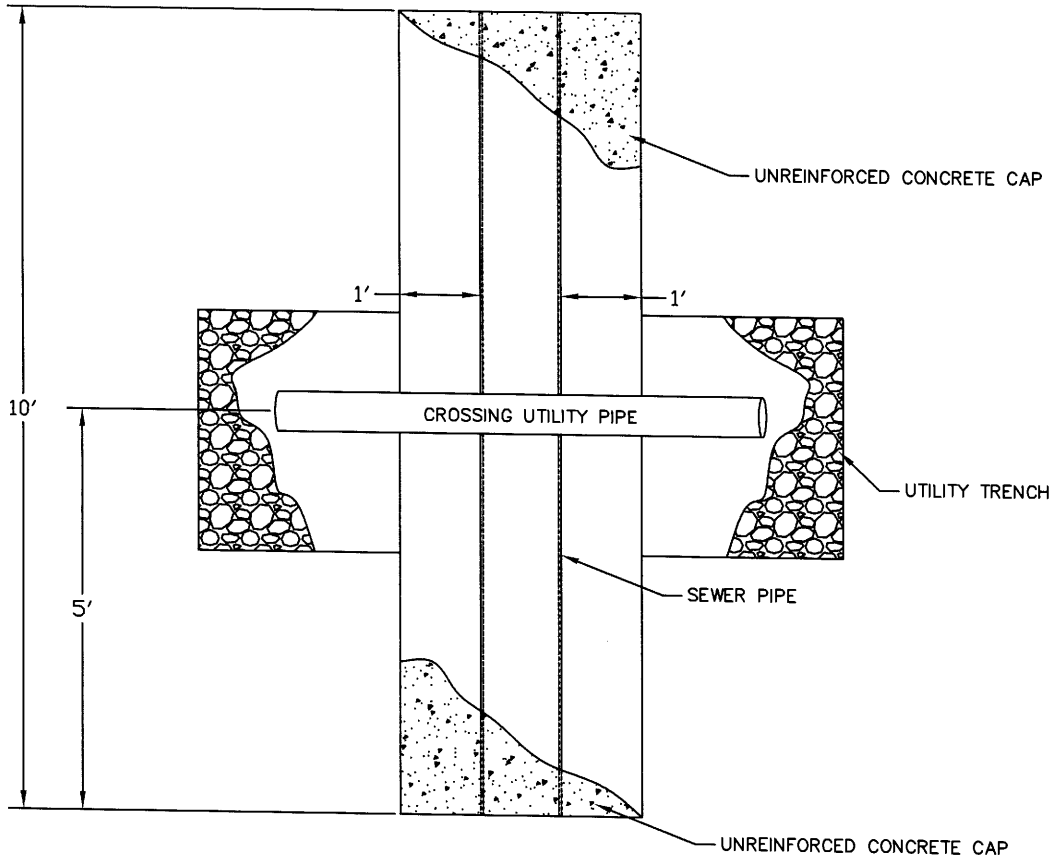
45° BEND. ANGLE TOWARDS  
 BOTTOM CORNERS.

EXTENDS TO POINT  
 50% OF DISTANCE  
 BETWEEN STATIC  
 FLUID LEVEL  
 AND BOTTOM.

THE  
 METROPOLITAN SEWER DISTRICT  
 OF  
 GREATER CINCINNATI  
**STANDARD  
 GREASE INTERCEPTOR**

NO SCALE DATE: MAY 2008  
 APPROVED: *Thomas H. Ashburn*  
 INTÉBIM SEWERS CHIEF ENGINEER

ACC. NO. 60870



NOTE:

UNREINFORCED CONCRETE CAP IS TO BE SIZED BASED ON THE FOLLOWING DIMENSIONS:  
 6" THICK  
 10' LONG (5' FROM THE CENTERLINE OF THE CROSSING UTILITY PIPE IN BOTH DIRECTIONS)  
 SEWER DIAMETER + 2' WIDE (EXTENDS 1' IN EITHER DIRECTION OVER THE SEWER PIPE)

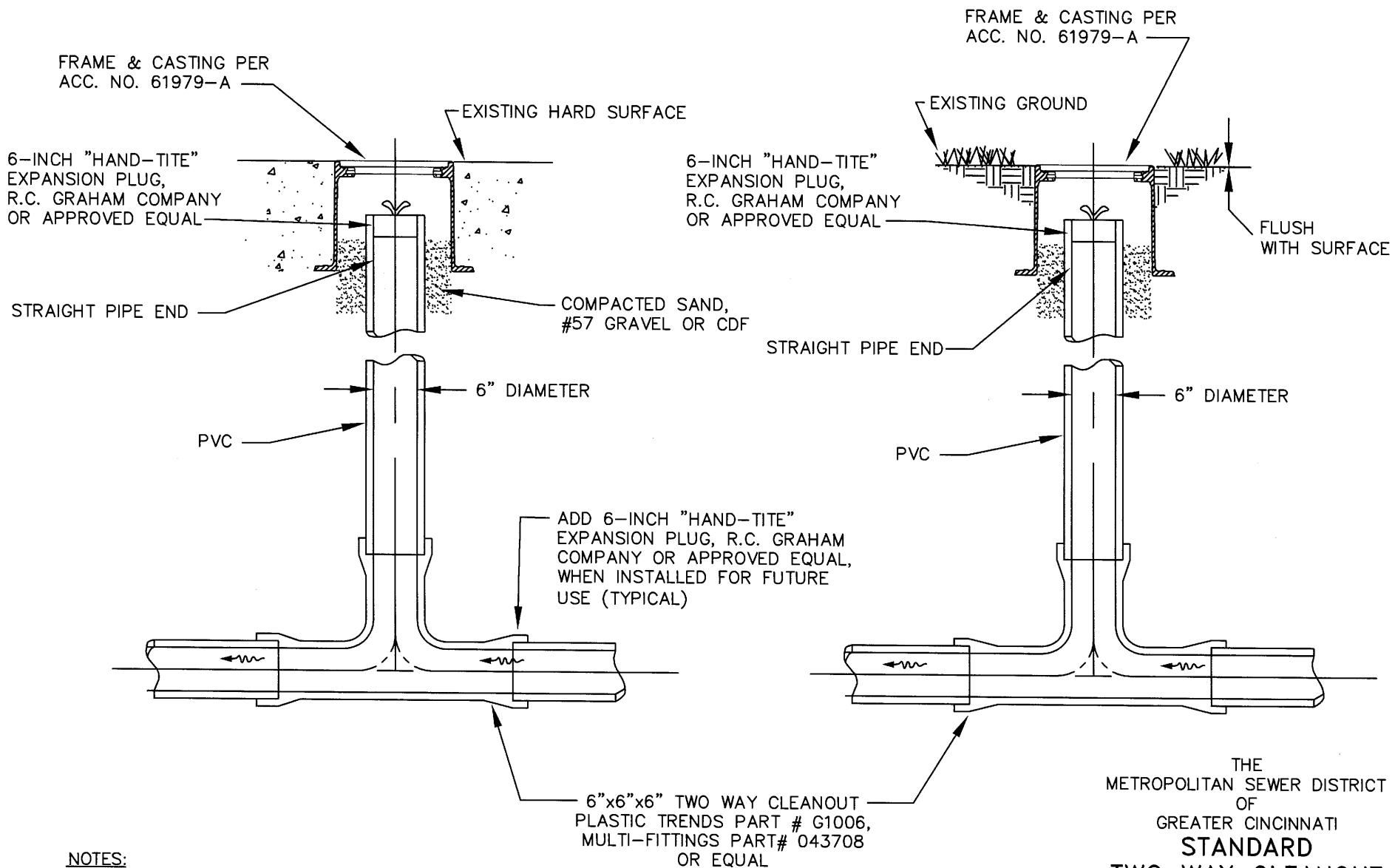
THE  
 METROPOLITAN SEWER DISTRICT  
 OF  
 GREATER CINCINNATI  
**UNREINFORCED  
 CONCRETE CAP**

NO SCALE

DATE, JUNE, 2009

APPROVED:

*Thomas R. Schwiers*  
 SEWERS CHIEF ENGINEER



**NOTES:**

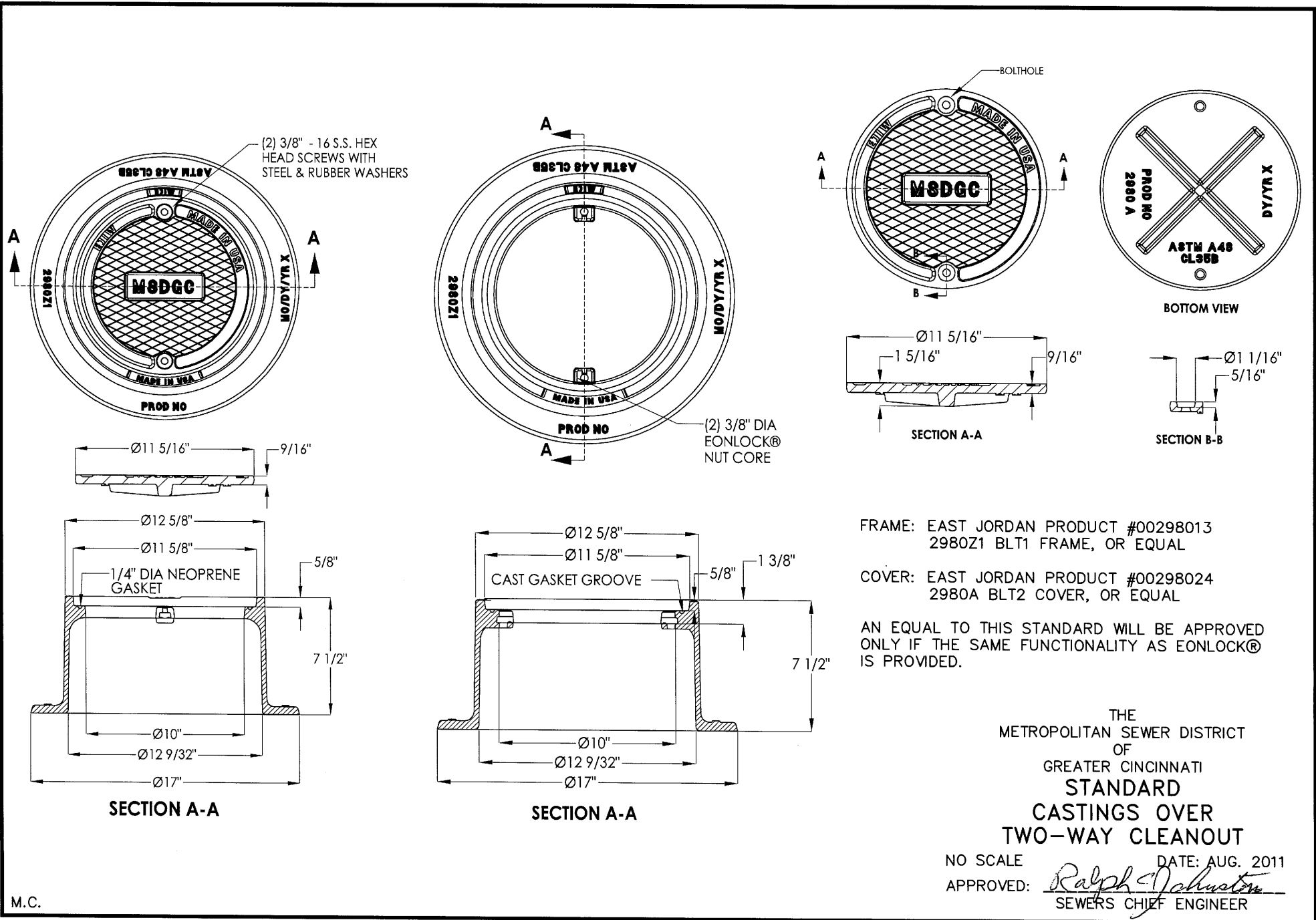
ALL JOINTS SHALL BE FLEXIBLE ELASTOMERIC SEALS, ASTM D-3212  
 CLEANOUTS SHALL BE PLACED EVERY 200 FEET, AND AT BENDS 45° OR GREATER

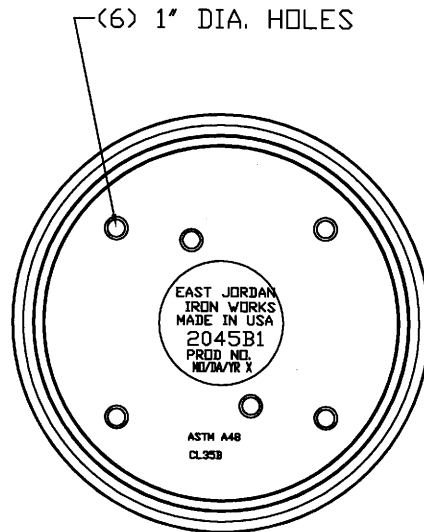
THE  
 METROPOLITAN SEWER DISTRICT  
 OF  
 GREATER CINCINNATI  
**STANDARD**  
**TWO WAY CLEANOUT**  
**FOR BUILDING SEWERS**

NO SCALE DATE: AUG. 2011  
 APPROVED: *Ralph Christone*  
 SEWERS CHIEF ENGINEER

M.C.

ACC. NO. 61979



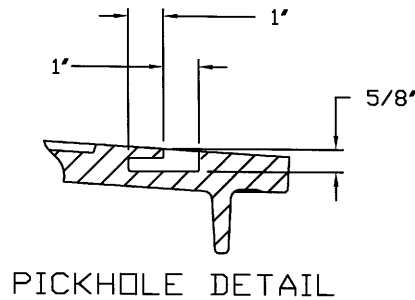
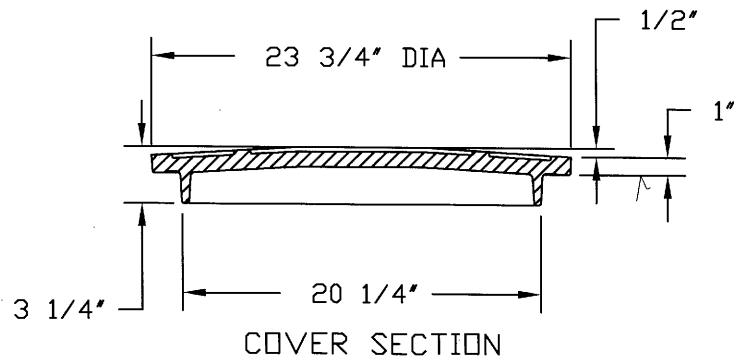


BOTTOM VIEW

THIS LID SHALL BE USED ON PRIVATE SEWERS ONLY. USE ACC. NO. 61980-A WHEN WATERTIGHT LID IS NECESSARY.

FRAME SHALL BE PER ACC. NO. 49005.

LID: EAST JORDAN PRODUCT #00204527  
2045B1 COVER, OR APPROVED EQUAL



THE  
METROPOLITAN SEWER DISTRICT  
OF  
GREATER CINCINNATI  
STANDARD LID  
ON PRIVATE SEWERS

NO SCALE

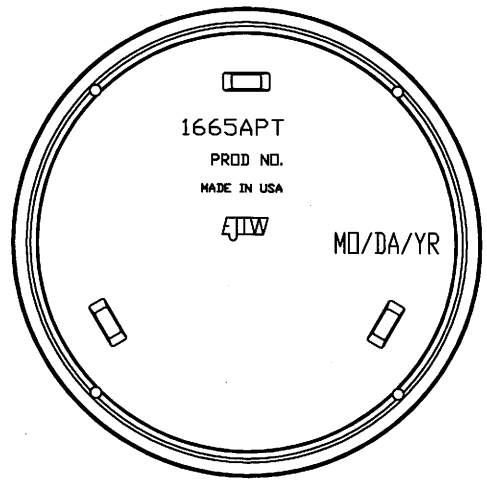
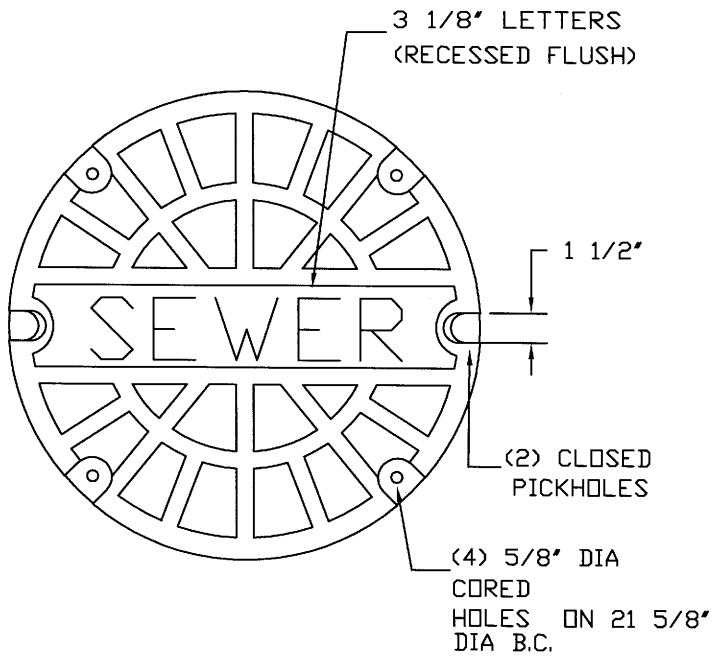
DATE: AUG. 2011

APPROVED:

*Ralph Johnston*  
SEWERS CHIEF ENGINEER

M.C.

ACC. NO. 61980

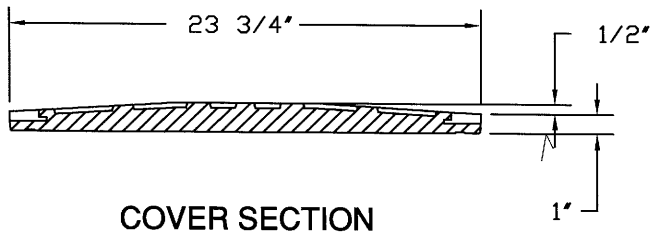


**BOTTOM VIEW**

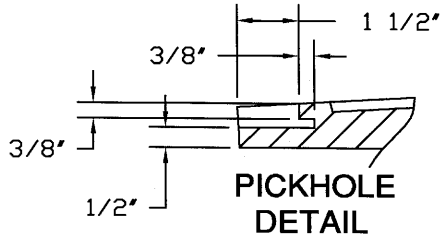
THIS LID SHALL BE USED ON PRIVATE SEWERS WHEN A WATERTIGHT LID IS REQUIRED.

FRAME SHALL BE PER ACC. NO. 49005.

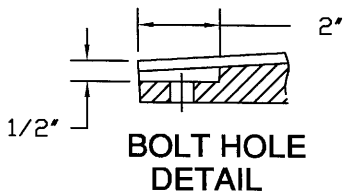
LID: EAST JORDAN PRODUCT #00166525  
1665APT COVER, OR APPROVED EQUAL



**COVER SECTION**



**PICKHOLE  
DETAIL**



**BOLT HOLE  
DETAIL**

THE  
METROPOLITAN SEWER DISTRICT  
OF  
GREATER CINCINNATI  
**STANDARD WATERTIGHT  
LID ON PRIVATE SEWERS**

NO SCALE

DATE: AUG. 2011

APPROVED: *Ralph C Johnston*  
SEWERS CHIEF ENGINEER

M.C.

**ACC. NO. 61980-A**