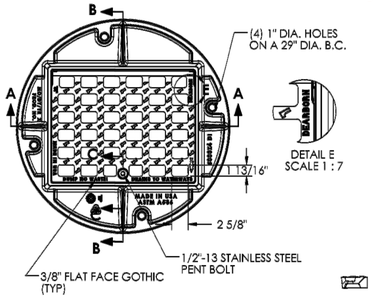
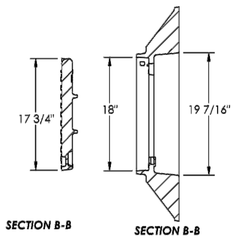
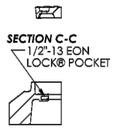
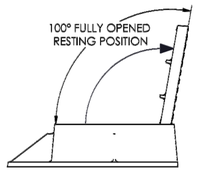
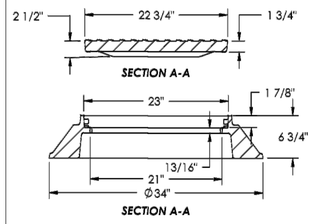
5000Z4 5000M4 Assembly

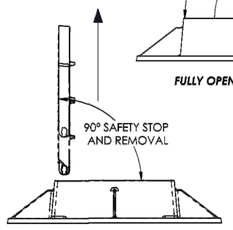












Product Number
00500077B01

Design Features
-Materials
Frame
Ductile Iron (80-55-06)
Grate
Ductile Iron (70-50-05)

-Design Load
Heavy Duty
-Open Area
160 sq in
-Coating
Dipped
-√ Designates Machined Surface

Weight = 237 lbs.

Certification
-ASTM A536
-
-
-Country of Origin: USA

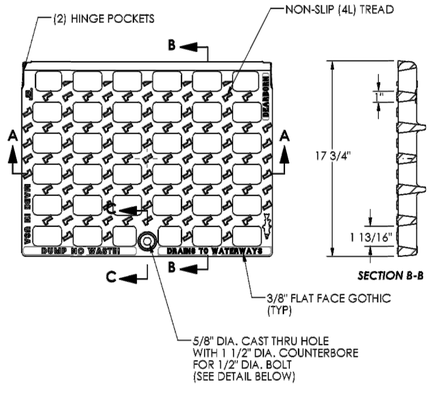
Major Components
00500016
00500077

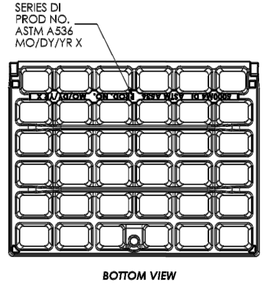
Drawing Revision
11/21/2012 Designer: DJH
01/10/2013 Revised By: DJH

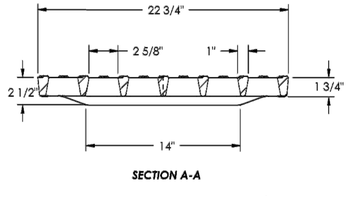
Contact
800 626 4653
ejco.com

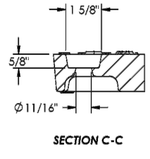
FOR CATCH BASIN/INLET NEW INSTALLATION

5000M4 Grade









Product Number
00500077

Design Features
-Materials
Ductile Iron (70-50-05)
-Design Load
Heavy Duty
-Open Area
160 sq in
-Coating
Dipped
-√ Designates Machined Surface

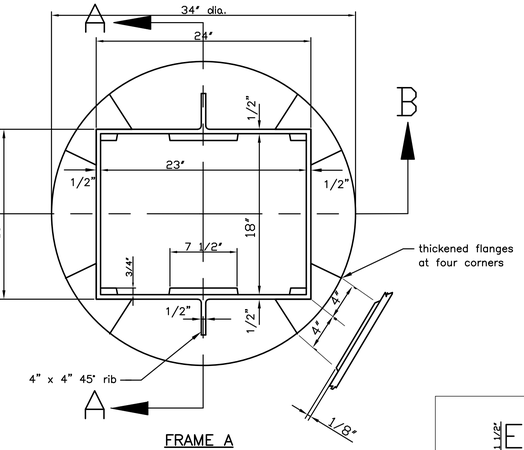
Weight = 85 lbs.

Certification
-ASTM A536
-
-
-Country of Origin: USA

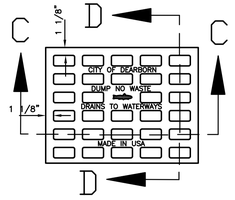
Drawing Revision
11/21/2012 Designer: DJH
7/2/2019 Revised By: DAE

Contact
800 626 4653
ejco.com

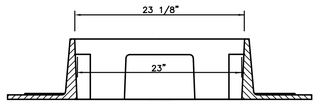
FOR CATCH BASIN/INLET NEW INSTALLATION



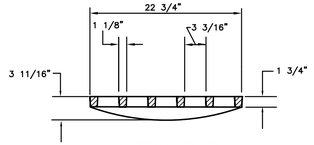
FRAME A
PLAN



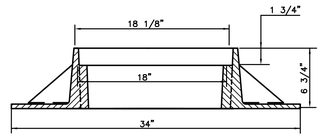
GRATE A
PLAN



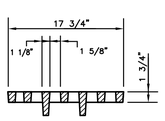
SECTION B–B
FRAME SECTION



SECTION C–C
Type M1 Grate (Parallel bar)



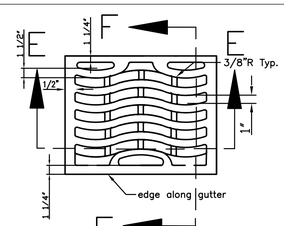
SECTION A–A
FRAME SECTION



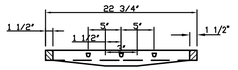
SECTION D–D
Type M1 Grate (Parallel Bar)

NOTE:
Grate B shall be used only in Rights of Way under the jurisdiction of the Wayne County Department of Public Services.

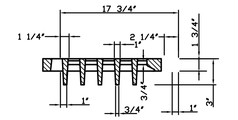
FOR CATCH BASIN/INLET REPAIR OR RETROFIT



GRATE B
PLAN

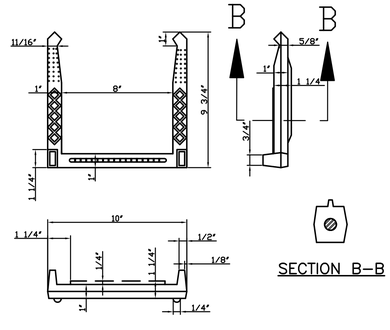


SECTION E–E
Type M2 Grate (Sinusoidal)



SECTION F–F
Type M2 Grate (Sinusoidal)

COVER DETAIL
Use for Wayne County Roads



PLASTIC MANHOLE STEP

GENERAL NOTES

MANHOLE & GATE WELL (NEW INSTALLATION)
FRAME: No. 1040, E.J.I.W., Base Flange Typ., Weight 154 lbs.
COVER: As shown in detail, Weight 125 lbs

CATCH BASIN & INLETS (NEW INSTALLATION)
FRAME: As shown in detail
COVER: As shown in detail

CATCH BASIN & INLETS (REPAIR OR RETROFIT)
FRAME A: No. 5080, E.J.I.W., Round Base, Weight 222 lbs.
GRATE A: Type M1, E.J.I.W., parallel bar grate = 29 holes or 160 sq. in. of opening, with City of Dearborn "Logo" Weight 111 lbs.
GRATE B: Type M2, E.J.I.W., sinusoidal grate = 160 sq. in. of opening, Weight 116 lbs. GRATE B shall be used only in Rights of Way under the jurisdiction of the Wayne County Department of Public Services.
GRATE C: Type M3, E.J.I.W., Restricted Grate, 2, 4 or 6 Openings, approx. 5 sq. in. per opening, Weight 123 lbs. (Same detail as GRATE A except number of openings)
GRATE D: Type 02, E.J.I.W., Beehive Grate, Height Above Frame – 6", Weight 101 lbs.

CASTINGS
Equivalent castings of other manufacturers may be substituted if approved by the engineer.

All casting shall meet the requirements of the current specifications ASTM Designation A–48 and shall have the same minimum strength as provided for No. 30 Gray Iron Castings.

The seating face of manhole lids and of catch basin inlet grates and the seats on the frames shall be machine finished to provide uniform bearing.

PLASTIC STEP
M. A. Industries, Inc., steel reinforced polypropylene plastic step (PS3) meeting requirements outlined in ASTM 2146–68 under Type II, Grade 16906.

CASTING STANDARDS

SCALE: HOR. NONE VERT. NONE | FLD. BK | SEC | QUAD

DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION
CITY OF DEARBORN, MICHIGAN

DATE: 02-02-15

APPROVED: _____ CITY ENGINEER

APPROVED: _____ CITY ENGINEER

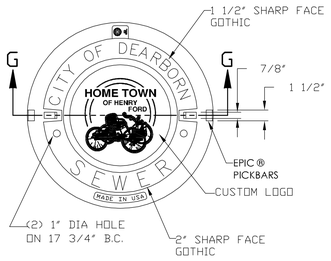
NO.	BY	REVISIONS	DATE
3	B.J.H.	UPDATED FOR CATCH BASIN/INLET REPAIR OR RETROFIT SECTIONS A-A & B-B	06-01-23
2	S.A.S.	UPDATED GRATE & ASSEMBLY DETAILS PER MANUFACTURER	10-21-20
1	S.A.S.	REV. NOTES; ADDED GRATE & ASSEMBLY SPECS; MOVED 1040C MH DETAIL TO SHEET C-2	02-02-15

DESIGN | DRAWN | CHECKED

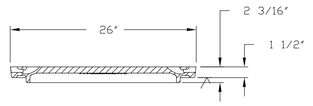
SHEET NO. C-1 OF ____

CASTING STANDARDS

1040C Cover with Pickbars



BOTTOM VIEW



COVER SECTION

EPIC® DETAIL

Product Number
00103958
Design Features
-Materials
Gray Iron (CL35B)
-Design Load
Heavy Duty
-Open Area
n/a
-Coating
Dipped
- √ Designates Machined Surface

Weight = 125 lbs.

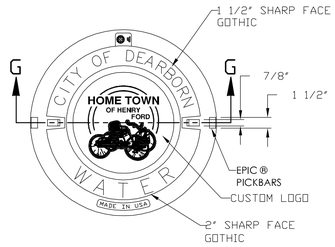
Certification
- ASTM A48
-
-
-Country of Origin:USA

Drawing Revision
01/07/2002 Designer: SBB
08/04/2014 Revised By: DAE

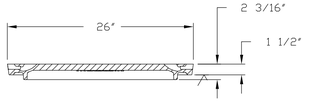
Contact
800 626 4653
ejco.com

STORM AND COMBINATION SEWER COVER DETAIL

1040A Cover with Pickbars



BOTTOM VIEW



COVER SECTION

EPIC® DETAIL

Product Number
00103957
Design Features
-Materials
Gray Iron (CL35B)
-Design Load
Heavy Duty
-Open Area
n/a
-Coating
Dipped
- √ Designates Machined Surface

Weight = 125 lbs.

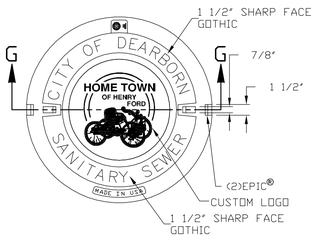
Certification
- ASTM A48
-
-
-Country of Origin:USA

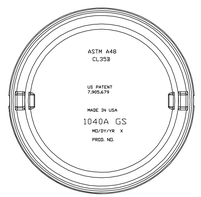
Drawing Revision
01/17/2002 Designer: SBB
8/4/2014 Revised By: DAE

Contact
800 626 4653
ejco.com

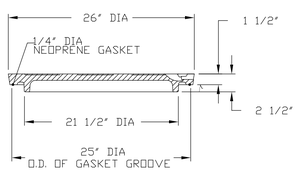
GATE WELL COVER DETAIL

1040AGS Cover with Pickbars

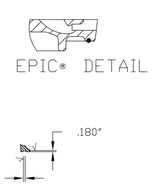




BOTTOM VIEW OF COVER



COVER SECTION

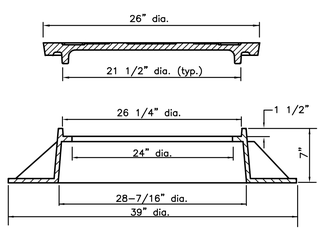


GROOVE DETAIL

Drawing Revision
09/06/2011 Designer: JIJ
8/4/2014 Revised By: DAE

Contact
800 626 4653
ejco.com

SANITARY SEWER COVER DETAIL



MANHOLE FRAME FOR STORM, SANITARY & GATE WELLS

TYPICAL SECTION G-G

GENERAL NOTES

MANHOLE & GATE WELL (NEW INSTALLATION)
FRAME: No. 1040, E.J.I.W., Base Flange Typ., Weight 154 lbs.
COVER: As shown in detail Weight 125 lbs.

CATCH BASIN & INLETS (NEW INSTALLATION)
FRAME: As shown in detail
COVER: As shown in detail

CATCH BASIN & INLETS (REPAIR OR RETROFIT)
FRAME A: No. 5080, E.J.I.W., Round Base, Weight 222 lbs.
GRATE A: Type M1, E.J.I.W., parallel bar grate = 29 holes or 160 sq. in. of opening, with City of Dearborn "Logo" Weight 111 lbs.
GRATE B: Type M2, E.J.I.W., sinusoidal grate = 160 sq. in. of opening, Weight 116 lbs. GRATE B shall be used only in Rights of Way under the jurisdiction of the Wayne County Department of Public Services.
GRATE C: Type M3, E.J.I.W., Restricted Grate, 2, 4 or 6 Openings, approx. 5 sq. in. per opening, Weight 123 lbs. (Same detail as GRATE A except number of openings)
GRATE D: Type 02, E.J.I.W., Beehive Grate, Height Above Frame – 6", Weight 101 lbs.

CASTINGS
Equivalent castings of other manufacturers may be substituted if approved by the engineer.

All casting shall meet the requirements of the current specifications ASTM Designation A-48 and shall have the same minimum strength as provided for No. 30 Gray Iron Castings.

The seating face of manhole lids and of catch basin inlet grates and the seats on the frames shall be machine finished to provide uniform bearing.

PLASTIC STEP
M. A. Industries, Inc., steel reinforced polypropylene plastic step (PS3) meeting requirements outlined in ASTM 2146-68 under Type II, Grade 16906.

DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION
CITY OF DEARBORN, MICHIGAN

APPROVED: _____ ASST. CITY ENGINEER
APPROVED: _____ CITY ENGINEER
DATE: 02-02-15

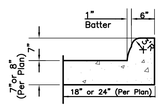
SCALE: HOR. NONE VERT. NONE FLD. BK SEC QUAD

NO.	BY	REVISIONS	DATE
1	S.A.S.	REV. NOTES; ADDED MH COVER SPECS & FRAME DETAIL; MOVED OTHER SPECS TO SHEET C-1	02-02-15

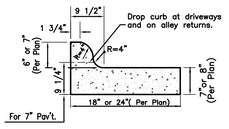
DESIGN | DRAWN | CHECKED

SHEET NO. C-2 OF ____

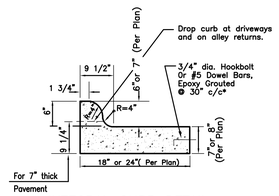
CONCRETE PAVEMENT STANDARD



INTEGRAL STRAIGHT CURB DETAIL

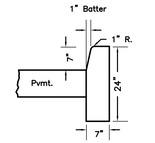


CURB & GUTTER DETAIL
(FOR ASPHALT PAVEMENT)

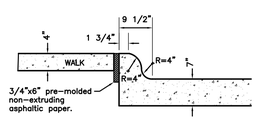


INTEGRAL CURB DETAIL
(FOR CONCRETE PAVEMENT AND BASE COURSE)

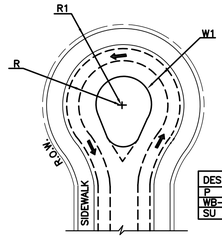
* For integral curb repair, refer to intersection plan for full width or partial width pavement construction.



STRAIGHT CURB



INTEGRAL CURB DETAIL
AT CROSSWALKS



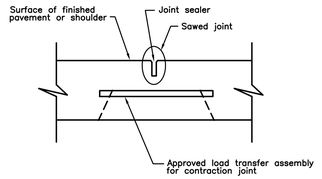
CIRCULAR
CUL–DE–SAC

DES. VEHICLE	R	W	R1
P	30'	18'	48'
WB–40	42'	25'	60'
SU & WB–50	47'	30'	65'

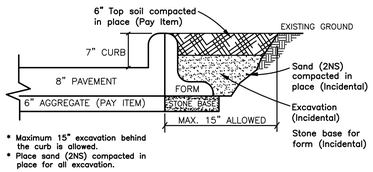
GENERAL NOTES

Transverse construction joints shall be placed at the ends of all pours and at places where paving operations are discontinued for a period of more than one–half hour except where such pours end at contraction or expansion joints. Construction joints shall not be less than 10 feet from any adjacent joints. Sections of pavement less than 10 feet in length between adjacent joints, if constructed, shall be removed at the contractor's expense.

All transverse joints in concrete pavement shall extend through the integral curb and shall be of the same kind and thickness as provided for the pavement, except that a premoulded bituminous filler shall be used in the integral curb when a temporary filler such as polystyrene is used in the pavement. The joint material shall be pre–cut so as to conform to the geometric shape and cross–sectional area of the curb, and shall be placed in contact with the filler material in the pavement. The edges of all transverse joints in the integral curb shall be rounded with the approved finishing tool, having a radius of 1/4 inch.

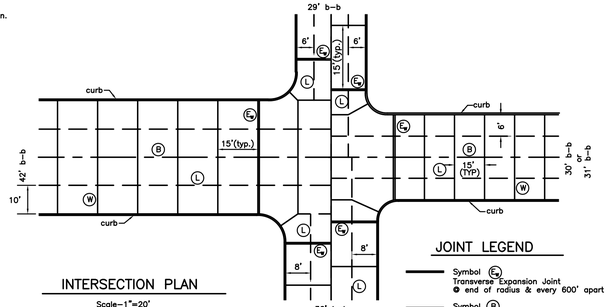


TRANSVERSE CONTRACTION JOINT
FOR REINFORCED CONCRETE



* Maximum 15" excavation behind the curb is allowed.
* Place sand (2NS) compacted in place for all excavation.

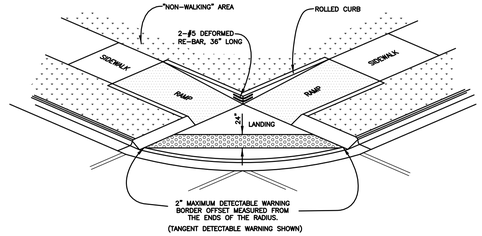
① ③ ④ ⑤ CONCRETE FORM SETUP & BACKFILLING DETAILS BEHIND THE CURB



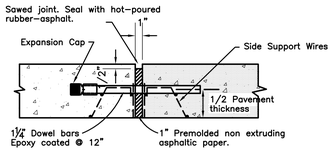
INTERSECTION PLAN
Scale–1"=20'

JOINT LEGEND

- Symbol (E_W) Transverse Expansion Joint @ end of radius & every 600' apart
- Symbol (B) Longitudinal Bulkhead Construction Joint
- Symbol (L) Longitudinal Lane Tie Joint
- Symbol (W) Transverse Plane of Weakness Joint

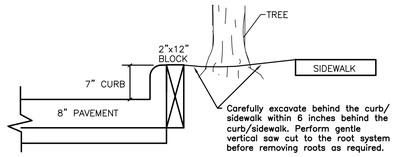


② SIDEWALK RAMP TYPE D
(DEPRESSED CORNER)

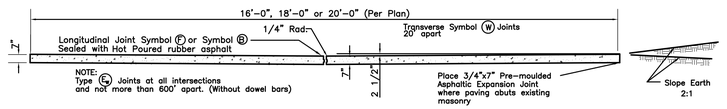


TRANSVERSE EXPANSION JOINT

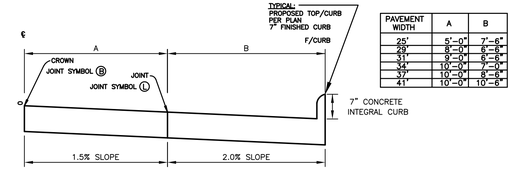
WITH LOAD TRANSFER – SYMBOL (E_W)



③ ④ CONCRETE FORM SETUP & BACKFILLING DETAILS BEHIND THE CURB IN THE VICINITY OF TREES

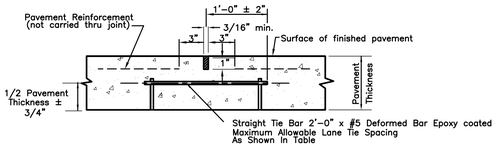


TYPICAL SECTION
ALLEY PAVEMENT



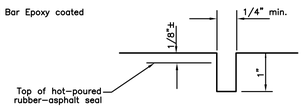
PAVEMENT WIDTH	A	B
25'	5'–0"	7'–6"
29'	8'–0"	6'–6"
31'	9'–0"	6'–6"
34'	10'–0"	7'–0"
37'	10'–0"	8'–6"
41'	10'–0"	10'–6"

PROPOSED PAVEMENT SECTION
SCALE: 1"=3'

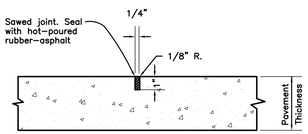


LONGITUDINAL LANE TIE JOINT

SYMBOL (L)



SAWED JOINT SEALED WITH
HOT–POURED RUBBER–ASPHALT



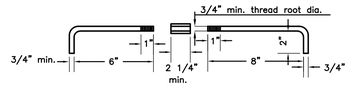
TRANSVERSE PLANE OF WEAKNESS JOINT
FOR PLAIN CONCRETE PAVEMENT

SYMBOL (W)

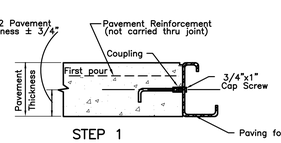
Maximum Allowable Lane Tie Spacing.	* Total Distance Of Tied Joint From Nearest Free Edge
4'–6 3/4"	12' or Less
3'–5"	12'+ thru 17'
2'–6 3/4"	17'+ thru 24'
2'–1 7/8"	24'+ thru 28'
1'–6 1/4"	28'+ thru 36'
** 1'–2"	36'+ thru 48'

* Includes any tied combination of lane width. Valley gutter, curb & gutter or shoulder.

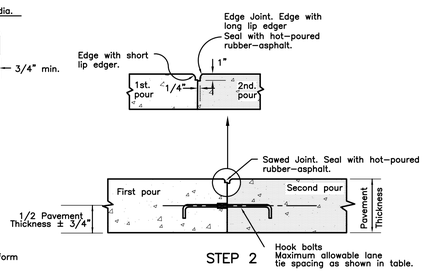
** For widths greater than 48', use No. 6 deformed bars spaced at 1'–2"



HOOK BOLT DETAIL



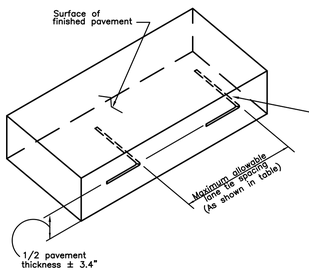
STEP 1



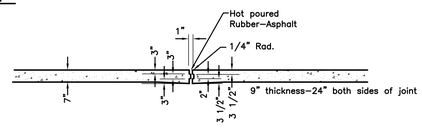
STEP 2

METHOD 2 HOOK BOLT METHOD
LONGITUDINAL BULKHEAD CONSTRUCTION JOINT

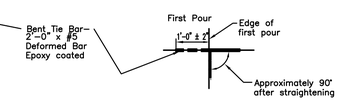
SYMBOL (B)

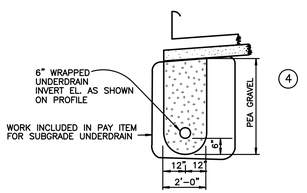


METHOD 1 BENT TIE BAR METHOD

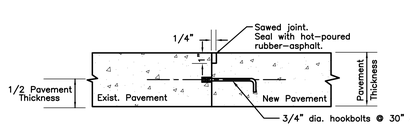


JOINT SYMBOL (F)
7 INCH SLAB

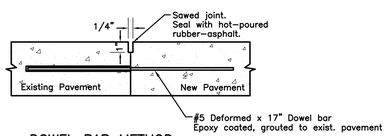




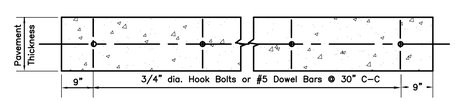
SUBGRADE UNDERDRAIN
DETAIL



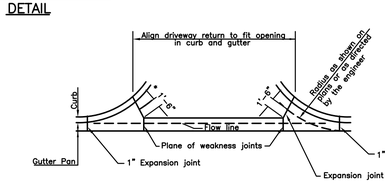
HOOK BOLT METHOD



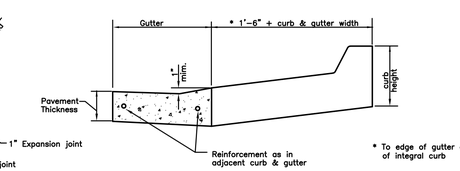
DOWEL BAR METHOD



SPACING LAYOUT FOR HOOK BOLTS OR DOWEL BARS
TRANSVERSE JOINT CONNECTING NEW PAVEMENT TO EXISTING PAVEMENT



CONCRETE DRIVEWAY OPENING – DETAIL M
FOR COMMERCIAL DRIVEWAY



SECTION A–A

DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION
CITY OF DEARBORN, MICHIGAN

APPROVED: _____ ASST. DIV. ENGINEER

APPROVED: _____ CITY ENGINEER

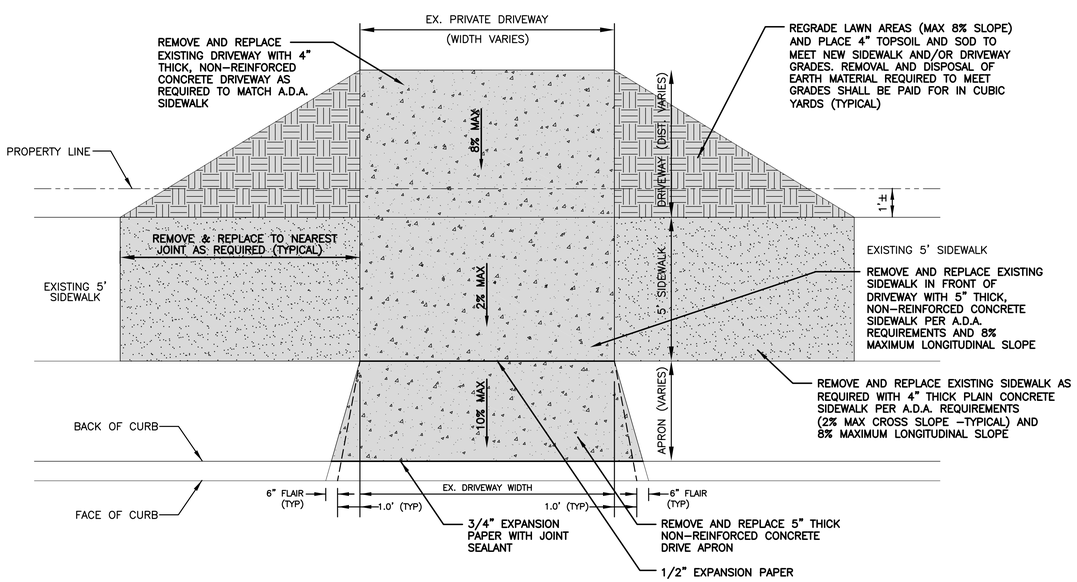
DATE: 02-02-15

SCALE: HOR. NONE VERT. NONE FLD. BK SEC QUAD

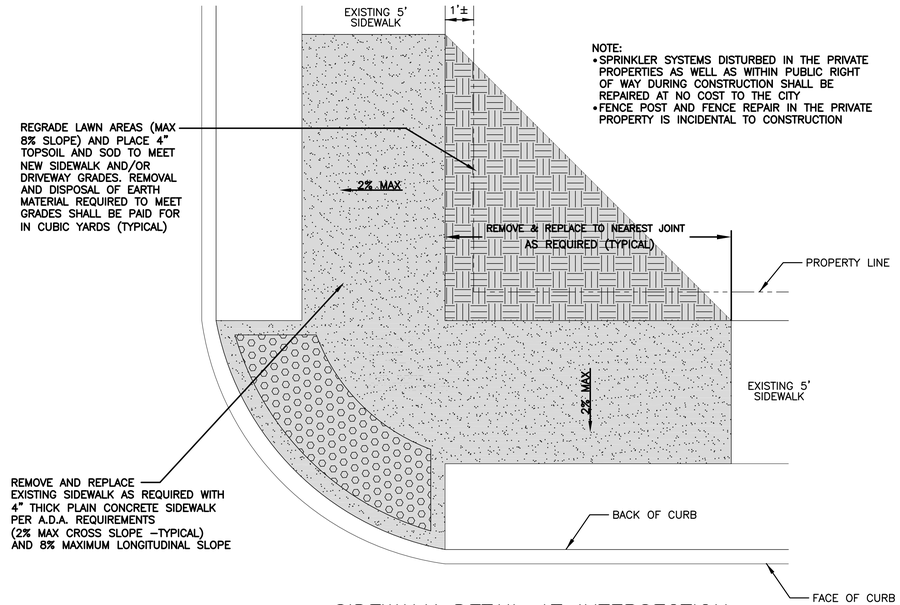
NO.	BY	REVISIONS	DATE
(5)	S.A.S.	REV. BACKFILLING DETAIL TO 6" TOPSOIL	11/17/20
(4)	S.A.S.	REV. SUBGRADE UNDERDRAIN & CONC. FORM DETAILS	11/07/18
(3)	S.A.S.	REV. EXCAVATION LIMIT (NOT IN VICINITY OF TREE) & CONC. FORM SETUP DETAILS	10/25/17
(2)	S.A.S.	ADD SIDEWALK RAMP TYPE D DETAIL	10/05/17
(1)	S.A.S.	REV. EXCAVATION LIMIT (NOT IN VICINITY OF TREE) DETAIL	10/22/15

DESIGN _____ DRAWN _____ CHECKED _____

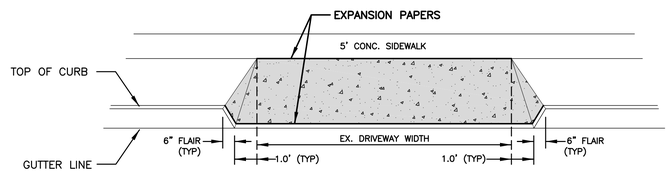
SHEET NO. CP-1 OF _____



TYPICAL RESIDENTIAL DRIVEWAY REPLACEMENT PLAN



SIDEWALK DETAIL AT INTERSECTION



TYPICAL APPROACH FLAIR DETAIL

CONCRETE PAVEMENT STANDARD

SCALE: HOR. NONE VERT. NONE FLD. BK SEC QUAD

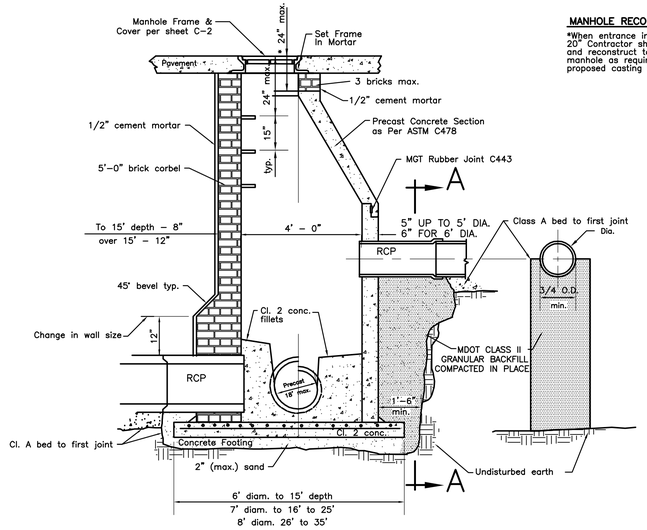
DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION
CITY OF DEARBORN, MICHIGAN

APPROVED: [signature] ABED CITY ENGINEER
APPROVED: [signature] CITY ENGINEER
DATE: 06-16-21

NO.	BY	REVISIONS	DATE

DESIGN | DRAWN | CHECKED

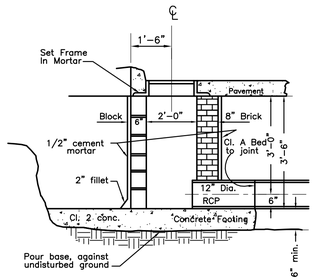
SHEET NO. CP-2 OF ____



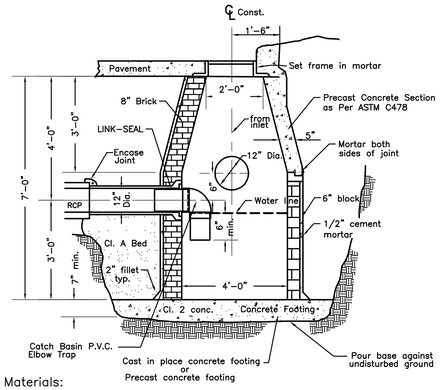
③ STANDARD MANHOLE

MANHOLE RECONSTRUCTION

*When entrance into manhole exceeds 20° Contractor shall remove corbel and reconstruct top section of manhole as required, to meet proposed casting elevation.



③ 2 FT. INLET



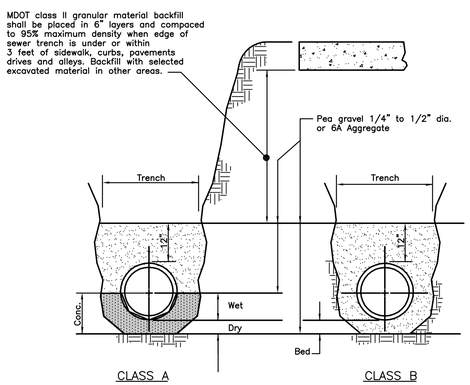
Materials:

a) 8" dia. P.V.C. pipe ASTM D3034-SDR35
1-18" long section
1-8" long section
1-90° Elbow

b)12 links of LINK-SEAL Model No. LS-475-s with stainless steel nuts and bolts as manufactured by Thunderline Corporation.

③ 4 FT. CATCH BASIN

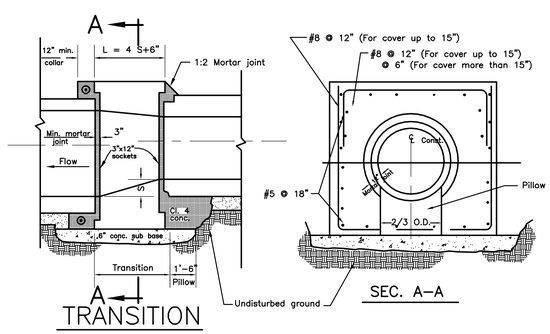
With trap on combined sewer systems



PIPE DIA.	BED	PIPE DIA.	TRENCH
8" - 60"	6"	8" - 15"	30"
66" - 108"	9"	18" - 30"	O.D. plus 18"
114" - UP	12"	36" - UP	O.D. plus 24"

② SEWER BEDDING - TRENCH DETAIL

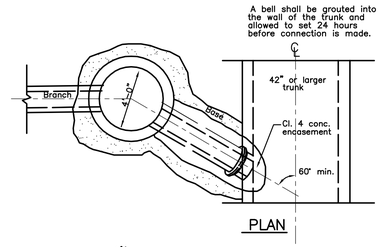
Excavating, Sewer/Bedding & Trench Backfill Shall be Incidental to Sewer Construction
Class A Bedding is Required for the Full Depth of Over Excavation.

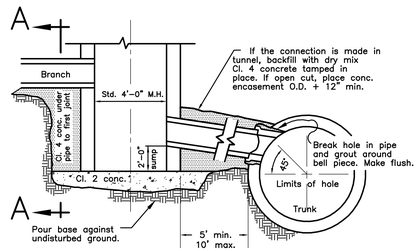


A TRANSITION

Collar and pillow

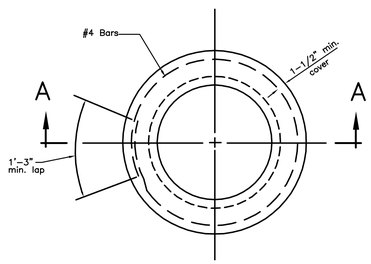
CONCRETE COLLAR FOR TWO DIFFERENT DIAMETERS CONCRETE AND/OR VCP PIPE, OR CONNECTING CONCRETE TO VITRIFIED CLAY PIPE

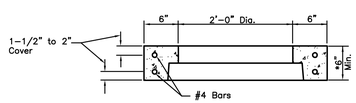




ELEVATION

CONNECTION TO EXISTING TRUNK





SECTION A-A

* When riser tongue length greater than 3", use 2 times tongue length.

Note: precast riser ring shall fully engage the tongue of the riser pipe.

PRECAST RISER RING

FOR 2' DIAMETER INLET

NOTES

1. Top of masonry structures shall be sufficiently low to permit proper adjustment of cover to grade with mortar or brick as directed by the Engineer.
2. The top portion of 4' diameter and larger precast reinforced manholes units shall be eccentric in design. The top section of the brick or block manhole units shall be corbelled to be eccentric.
3. Premium joints are required on all sanitary manholes. See A.S.T.M. designation C-923.
4. The bell shall be removed for the first length of outlet pipe projecting through the wall of the manhole.
5. Precast concrete sections, sumps, and flat top shall be built in accordance with A.S.T.M. C-478. The walls of the precast units may have a slight taper to allow for form removal. Precast concrete 2' diameter drainage structures shall have a minimum 3" wall thickness with a 6" minimum bearing surface on top. See precast riser ring for 2' diameter structure.
6. Pipes entering or leaving precast structures shall not have an inside diameter greater than 2' less than the inside diameter of the structure, except pipes entering or leaving 2' inside diameter structures may have pipes 1' inside diameter or less.
7. The number of pipe openings in a riser shall be determined by the designer. Spacing between openings shall be 6" minimum. Openings may be constructed by casting, removing the green concrete, or by drilling the openings in cured concrete. No openings shall be made in precast units which leave less than 24" of undisturbed precast pipe, or would remove more than 30% of the circumference along any horizontal plane.
8. Precast concrete footings or bases shall be reinforced with #4 steel bars spaced at 1' both ways or with two layers of welded wire fabric of equivalent cross sectional area laid at right angles and wired together. Reinforcement shall be placed in top of footing and shall be marked. Steel reinforcement may be omitted in cast-in-place concrete footings.
9. Precast concrete footings & precast bottoms shall be supported by a compacted 6" aggregate base, compacted in place.
10. Concrete footing shall be cast-in-place or precast concrete. Precast concrete base sections are acceptable for manholes, catch basins & inlets. Concrete shall be poured against undisturbed ground. Poured concrete and mortar must be hard before being stressed with backfill or precast modules.
11. The minimum wall thickness for all 2', 4', and 5' drainage structures using concrete block, brick, or cast-in-place concrete shall be as shown in typical wall sections.
12. Approved adapter such as Fernco coupling to connect dissimilar pipe is acceptable.
13. Mortar shall be 1 part cement and 2 parts N.S. sand. Plaster all bricks and blocks with 1/2" mortar.
14. For Manholes, Catch Basins & Inlets If the base is over excavated it shall be backfilled with class 4 concrete.
15. Locate corbel and steps at 45° to outlet sewer.
16. Joints for clay pipe shall be internal rubber type gasket meeting the current A.S.T.M. Specification C425. Joints for concrete pipe shall be internal rubber type gasket meeting the current A.S.T.M. Specification C443.

① 17. Infiltration/Exfiltration. Maximum allowable rates shall be 100 gallons per mile per inch diameter of sewer per 24 hour day on any one run between manholes.

18. In precast sanitary manholes all holes for inlet and outlet pipe shall be formed or equipped for an approved flexible joint connection such as "Res-Seal", "Press-Wedge" or "Kor-N-Seal" or equal.
19. No roof drain or down spout shall be connected to any city sewer or private sewer which is discharging to the city sewer.
20. Castings shall meet the requirements of the current specification A.S.T.M. designation A-48 and shall have the same minimum strength as provided for #30 gray iron castings.
21. All construction shall conform to the current Standards & Specifications.
22. ABS Truss pipe and/or PVC pipe shall comply with and be installed in accordance with current ASTM designation.
23. ABS or PVC Truss pipe constructed at depths greater than 12' below grade shall be tested for deflection. Deflection shall not exceed 5% of the normal pipe diameter.

STORM SEWER STANDARDS

SCALE: HOR. NONE VERT. NONE | FLD. BK | SEC | QUAD

DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION
CITY OF DEARBORN, MICHIGAN

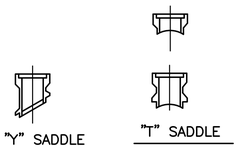
DATE: 02-02-15

APPROVED: _____ CITY ENGINEER

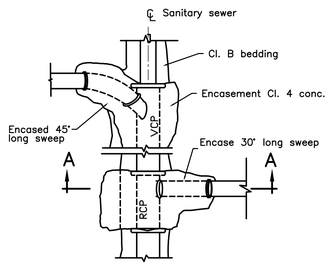
APPROVED: _____ CITY ENGINEER

NO.	BY	REVISIONS	DATE	CHECKED
③	S.A.S.	REV. MH DETAIL, INLET DETAIL & CB DETAIL	02-02-15	
②	J.G.S.	REV. TRENCH DETAIL	11-15-12	
①	M.P.	X	07-01-07	
	DESIGN		DRAWN	

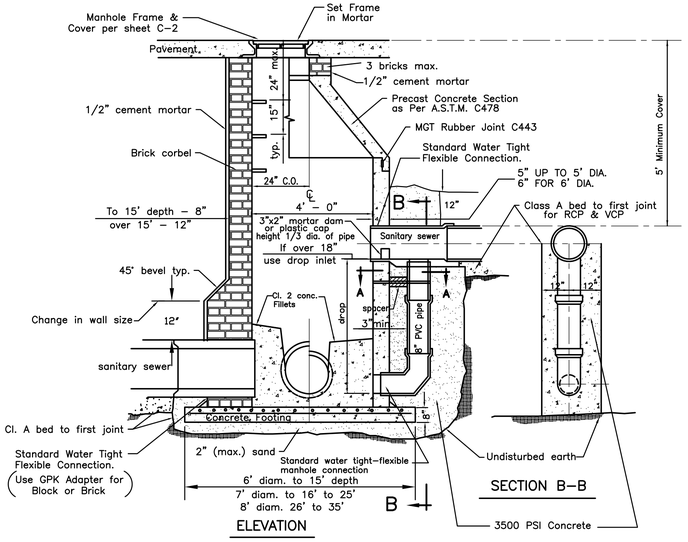
SHEET NO. S-1 OF _____



Standard saddles shall be used when spurs are cut into sewers.



PLAN



ELEVATION

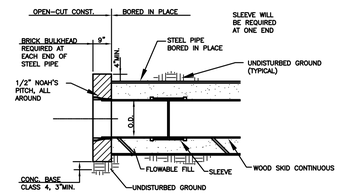
SECTION B–B

④ 4 FT. MANHOLE

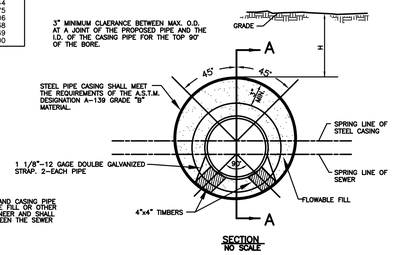
with drop inlet.**

** Internal drop inlet may be allowed with Engineer's approval.

NOMINAL THICKNESS OF CASING PIPE REQUIRED FOR R.R. XING	
NOMINAL DIA. IN INCHES	THICKNESS IN INCHES
10 AND UNDER	0.188
12 & 14	0.250
16	0.281
18	0.312
20 & 22	0.344
24	0.375
26	0.406
28	0.438
30	0.469
32	0.500
34 & 36	0.532
38	0.562
40	0.594
42	0.625
44 & 46	0.657
48	0.688
50	0.719
52	0.750
54	0.781
56 & 58	0.812
60	0.844
62	0.875
64	0.906
66 & 68	0.938
70	0.969
72	1.000



SECTION A–A
NO SCALE

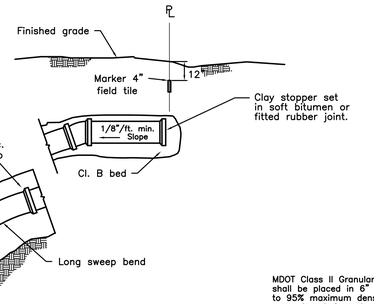


SECTION
NO SCALE

BACKFILL
SPACE BTWEEN THE SEWER PIPE AND CASING PIPE SHOULD BE FILLED WITH FLOWABLE FILL OR OTHER MATERIAL APPROVED BY THE ENGINEER AND SHALL COMPLETELY FILL ALL VOIDS BETWEEN THE SEWER AND THE CASING PIPE.

ALLOWABLE HEIGHT OF COVER (h) IN FT. FOR STEEL CASING											
WALL THICKNESS (th.)		STEEL CASING OUTSIDE DIAMETER (in.)									
FRACT.	DEC.	12	14	16	18	20	24	28	30	36	42
3/16	.1875	39	30	24	21	19	17	16	X	X	X
1/4	.250	50	50	39	31	27	21	19	18	16	X
5/16	.3125	X	X	50	48	39	28	23	21	18	17
3/8	.375	X	X	50	50	39	29	27	22	19	
7/16	.4375	X	X	X	X	50	39	34	26	21	
1/2	.500	X	X	X	X	X	50	44	31	25	
9/16	.5625	X	X	X	X	X	X	50	39	30	
5/8	.625	X	X	X	X	X	X	X	48	35	
MAX. NOMINAL DIA. OF SEWER (CARRIER)		8"	10"	12"	18"	20"	24"				

TYPICAL TUNNEL CASING DETAIL
FOR SEWER BORED–IN–PLACE

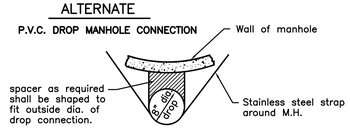


SECTION A–A

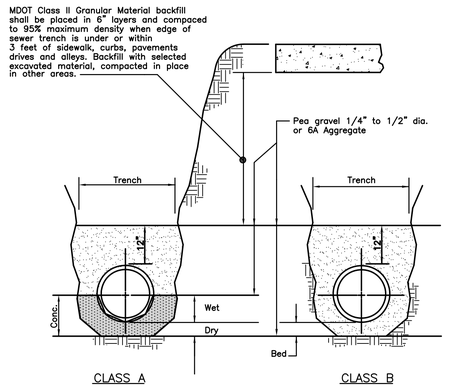
BUILDING CONNECTIONS

ALTERNATE

P.V.C. DROP MANHOLE CONNECTION



SECTION A–A

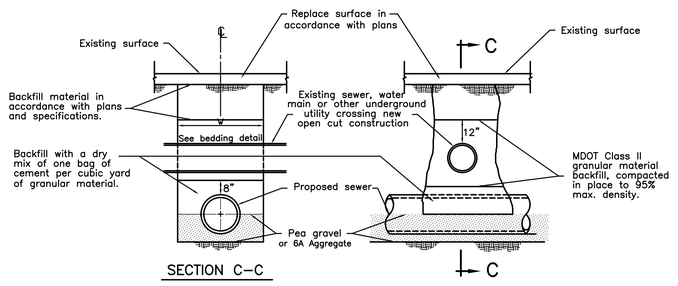


CLASS A CLASS B

PIPE DIA.	BED	PIPE DIA.	TRENCH
8" – 60"	6"	8" – 15"	30"
66" – 108"	9"	18" – 30"	O.D. plus 18"
114" – UP	12"	36" – UP	O.D. plus 24"

SEWER BEDDING – TRENCH DETAIL

Excavating, Sewer/Bedding & Trench Backfill Shall be Incidental to Sewer Construction
④ Class A Bedding is Required for the Full Depth of Over Excavation.



SECTION C–C

UTILITY CROSSING

This item is incidental to construction

NOTES

1. Top of masonry structures shall be sufficiently low to permit proper adjustment of cover to grade with mortar or brick as directed by the Engineer.
2. The top portion of 4' diameter and larger precast reinforced manholes units shall be eccentric in design. The top section of the brick or block manhole units shall be corbelled to be eccentric.
3. Premium joints are required on all sanitary manholes. See A.S.T.M. designation C–923.
4. The bell shall be removed for the first length of outlet pipe projecting through the wall of the manhole.
5. Precast concrete sections, sumps, and flat top shall be built in accordance with A.S.T.M. C–478. The walls of the precast units may have a slight taper to allow for form removal. Precast concrete 2' diameter drainage structures shall have a minimum 3" wall thickness with a 6" minimum bearing surface on top. See precast riser ring for 2' diameter structure.
6. Pipes entering or leaving precast structures shall not have an inside diameter greater than 2' less than the inside diameter of the structure, except pipes entering or leaving 2' inside diameter structures may have pipes 1' inside diameter or less.
7. The number of pipe openings in a riser shall be determined by the designer. Spacing between openings shall be 6" minimum. Openings may be constructed by casting, removing the green concrete, or by drilling the openings in cured concrete. No openings shall be made in precast units which leave less than 24" of undisturbed precast pipe, or would remove more than 30% of the circumference along any horizontal plane.
8. Precast concrete footings or bases shall be reinforced with #4 steel bars spaced at 1' both ways or with two layers of welded wire fabric of equivalent cross sectional area laid at right angles and wired together. Reinforcement shall be placed in top of footing and shall be marked. Steel reinforcement may be omitted in cast–in–place concrete footings.
9. Precast concrete footings & precast bottoms shall be supported by a compacted 6" aggregate base, compacted in place.
10. Concrete footing shall be cast–in–place or precast concrete. Precast concrete base sections are acceptable for manholes, catch basins & inlets. Concrete shall be poured against undisturbed ground. Poured concrete and mortar must be hard before being stressed with backfill or precast modules.
11. The minimum wall thickness for all 2', 4', and 5' drainage structures using concrete block, brick, or cast–in–place concrete shall be as shown in typical wall sections.
12. Approved adapter such as Fernco coupling to connect dissimilar pipe is acceptable.
13. Mortar shall be 1 part cement and 2 parts N.S. sand. Plaster all bricks and blocks with 1/2" mortar.
14. For Manholes. Catch Basins & Inlets
    If the base is over excavated it shall be backfilled with class 4 concrete.
15. Locate corbel and steps at 45° to outlet sewer.
16. Joints for clay pipe shall be internal rubber type gasket meeting the current A.S.T.M. Specification C425. Joints for concrete pipe shall be internal rubber type gasket meeting the current A.S.T.M. Specification C443.
① 17. Infiltration/Exfiltration. Maximum allowable rates shall be 100 gallons per mile per inch diameter of sewer per 24 hour day on any one run between manholes.
18. In precast sanitary manholes all holes for inlet and outlet pipe shall be formed or equipped for an approved flexible joint connection such as "Res–Seal", "Press–Wedge" or "Kor–N–Seal" or equal.
19. No roof drain or down spout shall be connected to any city sewer or private sewer which is discharging to the city sewer.
20. Castings shall meet the requirements of the current specification A.S.T.M. designation A–48 and shall have the same minimum strength as provided for #30 gray iron castings.
21. All construction shall conform to the current Standards & Specifications.
22. ABS Truss pipe and/or PVC pipe shall comply with and be installed in accordance with current ASTM designation.
23. ABS or PVC Truss pipe constructed at depths greater than 12' below grade shall be tested for deflection. Deflection shall not exceed 5% of the normal pipe diameter.
② 24. No ground water, storm water, construction water, downspout drainage shall be allowed to enter any sanitary sewer installation.
② 25. All manholes, manhole access diameters and appurtenances shall meet the requirements of Section 34 of the 2004 Edition of the Ten States Standards.
② 26. There shall be no discharge of untreated sanitary sewerage to the surface waters of the State due to construction activity associated with this project.

SANITARY/COMBINED SEWER STANDARDS

SCALE: HOR. NONE VERT. NONE FLD. BK SEC QUAD

DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION
CITY OF DEARBORN, MICHIGAN

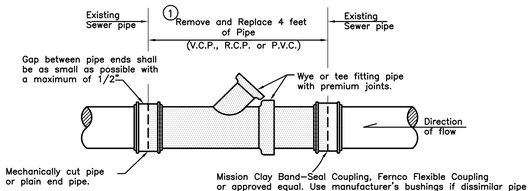
DATE: 02-02-15

APPROVED: _____ DIRECTOR OF PUBLIC SERVICE
APPROVED: _____ CITY ENGINEER

NO.	BY	REVISIONS	DATE
④	S.A.S.	REV. 4 FT. MANHOLE DETAIL: ADD NOTE TO TRENCH DETAIL	02-02-15
③	J.G.S.	REV. TRENCH DETAIL	11-15-12
②	M.P.	X	06-05-09
①	M.P.	X	07-01-07

DESIGN | DRAWN | CHECKED

SHEET NO. S-2 OF ____



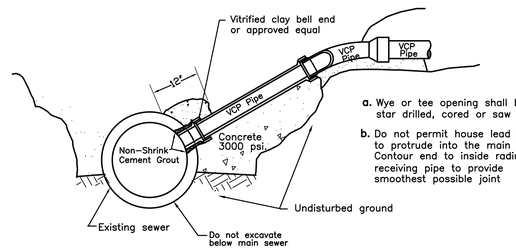
Note: Pipe shall be bedded in Class "B" granular bedding, or if directed, concrete shall be used below springline and granular material 12" above pipe.

METHOD "A"

① WYE PIPE INSERTION WITH FLEXIBLE COUPLING

(FOR SEWER TAP WHERE MAIN SEWER PIPE IS LESS THAN 10" DIAMETER)

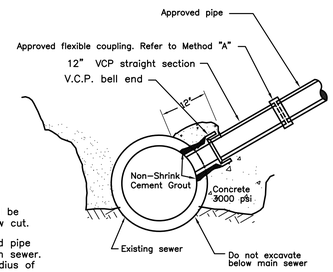
no scale



DETAIL ONE

a. Wye or tee opening shall be star drilled, cored or saw cut.

b. Do not permit house lead pipe to protrude into the main sewer. Contour end to inside radius of receiving pipe to provide smoothest possible joint



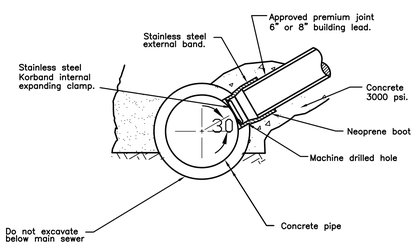
DETAIL TWO

METHOD "B"

① DIRECT TAP ON 10" AND LARGER MAIN LINES ONLY

V.C.P. OR R.C.P. ONLY

no scale



METHOD "C"

KOR–N–TEE TAP FOR CONCRETE PIPE

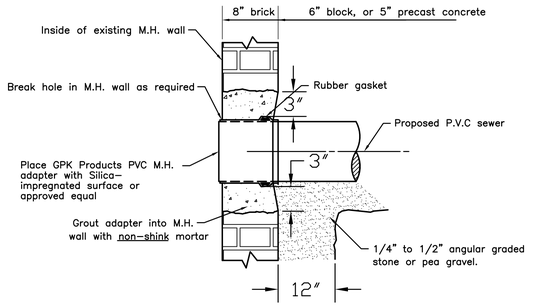
no scale

a. Opening shall be cored

METHOD "D"

SADDLE TAP ON ALL PVC MAIN LINES

no scale



MANHOLE CONNECTION DETAIL FOR

CONNECTING PVC PIPE TO BRICK, BLOCK OR

PRECAST CONCRETE MANHOLES

no scale

NON SHRINK GROUT	
NON SHRINK GROUT SHALL BE PREMIXED NON METALLIC, NON STAINING DIMENSIONALLY STABLE, INORGANIC GROUT AS MANUFACTURED BY:	
MANUFACTURER OR EQUAL	PRODUCTS OR EQUAL
MASTER BUILDERS	"MASTER FLOW 813 GROUT"
W.R. MEADOWS, INC.	"SEALTIGHT V–1 GROUT"
SET PRODUCTS	"NON SHRINK GROUT"
SONNEBORN – CONTECH	"SONOGROUT"
THE EUCLID CHEMICAL CO.	"EUCO N–S"
THE UPCO CO.	"UPCON HIGH FLOW"
PRECO INDUSTRIES, LTD.	"DURA–FLOW GROUT"
U.S. GROUT CORP.	"FIVE STAR GROUT"

BUILDING LEAD REQUIREMENTS

A. All building lead work will be constructed in accordance with the current standards and specifications of the City of Dearborn.

B. The sewer Contractor shall obtain a permit for all building lead work from the City of Dearborn Department of Building and Safety and pay all required plan review and inspection fees.

C. All building lead work will be performed under City of Dearborn Department of Building and Safety inspection and/or Engineering Division.

D. No sanitary sewer shall be used as dewatering outlet.

E. Use City of Dearborn approved adapter to connect two dissimilar sewer pipes. The approved adapters are as follows:

1. Mission Clay Band–Seal Coupling.
2. Fernco Flexible Coupling / 6"x6" Strong Back PVC Shielded Coupling (Clay to PVC) ②
3. Stainless steel water repair clamps such as Smith–Blair, Baker, Ford or equal.
4. Fernco reducer and adapter donuts.
5. Fernco Flexible Coupling – The HULK Coupling "HULK 6" (Clay to PVC) Complies with ASTM C 1173 and CSA B602 ③

F. Approved building lead materials – 6" minimum diameter pipe:

1. Vitrified clay pipe – N.C.P.I. ERA–67 Extra strength A.S.T.M. C700 with the following A.S.T.M. C425 joints:

a) O–Ring e) A–Ring i) Fiburloc
b) Uniloc f) Wedgelock j) Tylox
c) Amvit g) Deflec/Tite k) Stre–Tite
d) Nobel h) Loxon l) Slip–Seal

2. Polyvinyl Chloride (PVC) Pipe – A.S.T.M. D2665 or D1785 Schedule 40.

a) Elastomeric gasket push–on joint A.S.T.M. D3212.
b) Solvent cemented joint – A.S.T.M. D2564 & D2855. Purple Primer to be used on all joints.

3. Acrylonitrile Butadiene Styrene (ABS) Pipe A.S.T.M. D2751 SDR 23.5.

a) Solvent welded joint with primer.

G. Building connections shall be made to existing wye or tee fittings where possible. Refer to details shown on Sanitary Sewer Standards sheet.

New connections to old building services will not be permitted, unless approved by the Engineer. A new sewer service shall be placed from the City sewer to the proposed building. The existing wye connection shall be replaced if found to be broken.

If necessary, direct taps to main sewers where wye or tee openings are not provided, shall be done in accordance with the details shown on this sheet.

All direct taps shall be approved, in advance, by the Engineering Division. A particular sewer connection method will be specified by the City Engineer.

H. At connections to manholes, where the difference in invert elevations between the building connection and the outlet sewer exceeds 18", an exterior drop connection will be required. Interior drop connections may be allowed with Engineer's approval.

I. At connections to existing manholes, holes shall be drilled at 4" center to center around periphery of opening to create a plane of weakness before breaking out section or cored using a drilling machine.

For concrete or vitrified clay pipe connections, non–shrink grout shall be used to seal the opening and a concrete collar shall be poured 12" thick around the pipe and extended 12" beyond the opening.

For PVC and ABS pipe, all openings shall be fitted with an approved adapter. Refer to details on this sheet.

J. MDOT Class II Granular Backfill shall be placed and compacted to 95% maximum density when edge of sewer trench is under or within 3' of sidewalk, curbs, pavements, drives, building slabs and in alleys.

K. The Contractor will be responsible for temporary pavement patching and maintenance. Temporary surface shall consist of 2" asphaltic concrete surface with 6" aggregate base, compacted in place.

SEWER CONNECTION STANDARDS AND BUILDING LEAD REQUIREMENTS

SCALE: HOR. NONE VERT. NONE | FLD. BK | SEC | QUAD

DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION
CITY OF DEARBORN, MICHIGAN

DATE: 02-02-15

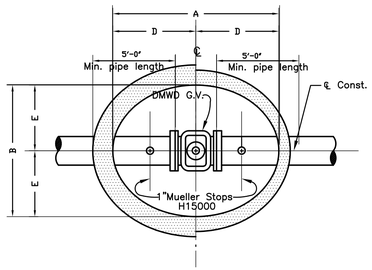
APPROVED: _____ ASST. CITY ENGINEER

APPROVED: _____ CITY ENGINEER

NO.	BY	REVISIONS	DATE
③	S.M.E.	ADDITION TO BUILDING LEAD REQUIREMENTS E-5	05-30-24
②	S.M.E.	ADDITION TO BUILDING LEAD REQUIREMENTS E-2	06-12-23
①	M.P.	X	04-14-11

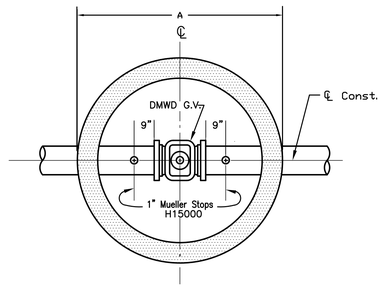
DESIGN _____ DRAWN _____ CHECKED _____

SHEET NO. S-3 OF _____

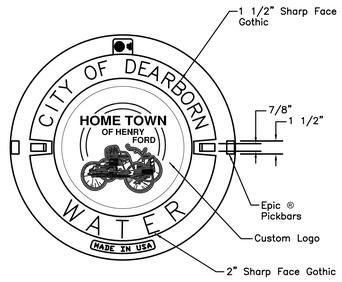


SECTION

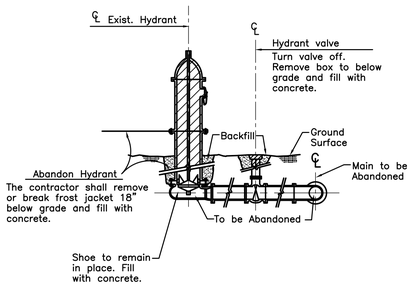
Flanged valve shown



SECTION



④ 1040A COVER



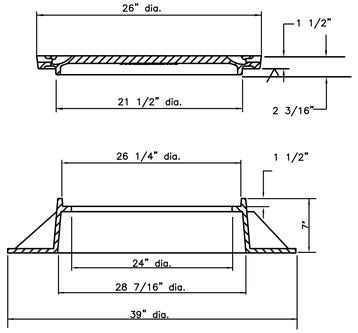
REMOVE AND SALVAGE HYDRANT

No Scale

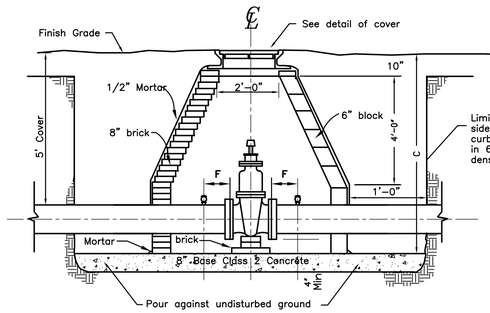
REMOVE AND REPLACE HYDRANT

Shall include the Removal/Replacement of Hydrant, 6" Valve, Road Box, Restraining glands & Thrust Blocks.

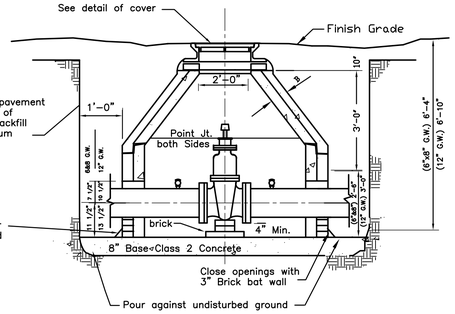
BOTTOM VIEW



SECTION G–G



ELEVATION



① IN PRECAST GATE WELL HOLES FOR INLET AND OUTLET PIPE SHALL BE FORMED OR EQUIPPED FOR AN APPROVED FLEXIBLE JOINT CONNECTION SUCH AS "RES-SEAL", "PRESS-WEDGE" OR "KOR-N-SEAL" OR EQUAL.

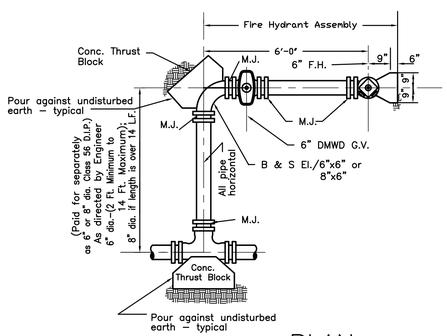
ELEVATION

Gate Valve	A	B	C	D	E	F
6"–8"	5'–0"	4'–0"	6'–3"	2'–6"	2'–0"	9"
12"	5'–6"	4'–6"	6'–8"	2'–9"	2'–3"	9"
16"	6'–0"	5'–6"	7'–2"	3'–0"	2'–9"	12"

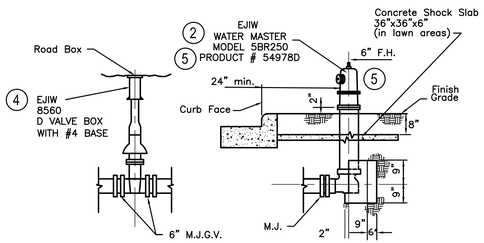
BRICK OR BLOCK GATE WELL

Gate Valve	A	B
6"	5'–0"	5"
8"	5'–0"	5"
12"	6'–0"	7"

PRECAST GATE WELL



PLAN



ELEVATION

FIRE HYDRANT ASSEMBLY

All 6" or 8" mechanical joints in the F.H. assembly shall be restrained with retainer glands.

Pipe and fittings shall be 6" or 8" D.I.P., Class 56

T bolts and set screws shall be Corten steel.

All new hydrants installed by the Contractor shall be repainted using Rustoleum 7543. "Safety Yellow." ③

STANDARD ABBREVIATIONS AS USED ON CONSTRUCTION PLANS	
G.V.	Gate valve
G.W.	Gate Well
El.	Elbow or Bend
T.	Tee
B.O.	Blow Off
T.B.	Thrust Block
12"C.I.P.	12" Cast Iron Water Pipe
16"D.I.P.	16" Ductile iron water Pipe
24"PCCP	24" Prestressed concrete cylinder Pipe
R.C.E.	Reinforced Concrete Encasement
S.P.E.	Steel Pipe Encasement
M.J.	Mechanical Joint
F.J.	Flanged Joint
F.H.	Fire Hydrant Assembly

ALLOWABLE DEFLECTION				
Diameter	6"	8"	12"	16"
Rubber Slip-joint	7 3/8"	7 3/8"	7 3/8"	4 1/2"
*Mechanical Joint	10 1/2"			
Inches per 10 feet of pipe				

* F.H. Assembly and all G.V. fittings.

NOTES RELATED TO GATE VALVE, GATE WELL & FIRE HYDRANTS ARE LISTED ON SHEET "W–2"

WATER STANDARDS
GATE WELL AND FIRE HYDRANT

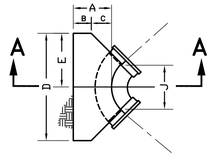
SCALE: HOR. NONE VERT. NONE | FLD. BK | SEC | QUAD

DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION
CITY OF DEARBORN, MICHIGAN

APPROVED: _____ DEPUTY DIRECTOR
APPROVED: _____ CITY ENGINEER
DATE: 02-02-15

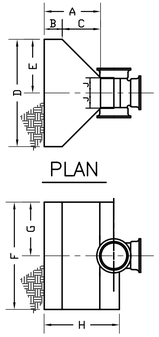
NO.	BY	REVISIONS	DATE	DESIGN	DRAWN	CHECKED
⑤	T.C.W.	MODEL CHANGE FOR FIRE HYDRANT	02-24-22			
④	S.A.S.	CHANGED COVER & REV. ELEVATION DETAIL	02-02-15			
③	C.J.R.	HYDRANT PAINT	03-22-10			
②	C.J.R.	MODEL CHANGE FOR FIRE HYDRANT	05-05-00			
①	C.J.R.	CONNECTION DETAIL ADDED FOR GATE WELL	03-19-97			

SHEET NO. W-1 OF ____



SCHEDULE OF THRUST BLOCK DIMENSIONS									
BEND SIZE	CODE								
	A	B MIN.	C	D	E	F	G	H MIN.	J
6"–45°	1'–9"	0'–9"	1'–0"	2'–0"	1'–0"	1'–6"	0'–9"	1'–11"	1'–4"
6"–90°	1'–9"	0'–9"	1'–0"	2'–6"	1'–3"	1'–6"	0'–9"	1'–11"	1'–2"
8"–45°	1'–9"	0'–9"	1'–0"	2'–4"	1'–2"	2'–0"	1'–0"	1'–11"	1'–4"
8"–90°	1'–9"	0'–9"	1'–0"	3'–4"	1'–8"	2'–6"	1'–3"	1'–11"	1'–2"
12"–22 1/2°	1'–9"	0'–9"	1'–0"	2'–6"	1'–3"	2'–0"	1'–0"	2'–0"	1'–4"
12"–45°	2'–1"	0'–9"	1'–4"	3'–6"	1'–9"	2'–6"	1'–3"	2'–4"	1'–4"
12"–90°	2'–1"	0'–9"	1'–4"	5'–6"	2'–9"	3'–0"	1'–6"	2'–4"	1'–8"
16"–22 1/2°	2'–8"	1'–0"	1'–8"	3'–4"	1'–8"	2'–6"	1'–3"	3'–0"	1'–2"
16"–45°	2'–8"	1'–0"	1'–8"	5'–4"	2'–8"	3'–0"	1'–6"	3'–0"	2'–6"
16"–90°	2'–8"	1'–0"	1'–8"	6'–0"	3'–0"	5'–0"	2'–6"	3'–0"	2'–8"

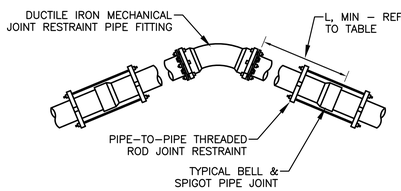
DETAIL OF STANDARD THRUST BLOCKS FOR BENDS



SCHEDULE OF THRUST BLOCK DIMENSIONS									
TEE SIZE	CODE								
	A	B MIN.	C	D	E	F	G	H MIN.	J
6" x 6"	1'–9"	0'–9"	1'–0"	2'–6"	1'–3"	1'–6"	0'–9"	2'–3"	0'–6"
8" x 8"	1'–9"	0'–9"	1'–0"	3'–0"	1'–6"	2'–0"	1'–0"	2'–3"	0'–6"
12" x 8"	1'–9"	0'–9"	1'–0"	3'–0"	1'–6"	2'–0"	1'–0"	2'–5"	0'–6"
12" x 12"	2'–1"	0'–9"	1'–4"	4'–0"	2'–0"	3'–0"	1'–6"	2'–9"	0'–8"
16" x 8"	1'–9"	0'–9"	1'–0"	3'–0"	1'–6"	2'–0"	1'–0"	2'–9"	0'–6"
16" x 12"	2'–1"	0'–9"	1'–4"	4'–0"	2'–0"	3'–0"	1'–6"	3'–1"	0'–8"
16" x 16"	2'–8"	1'–0"	1'–8"	5'–0"	2'–6"	4'–0"	2'–0"	3'–8"	0'–11"

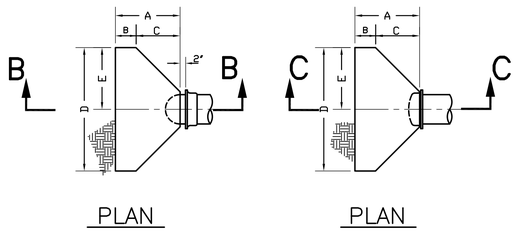
DETAIL OF STANDARD THRUST BLOCKS FOR TEES

ALL PIPE JOINTS FOR A DISTANCE "L" FEET BEYOND FITTING SHALL BE RESTRAINED.



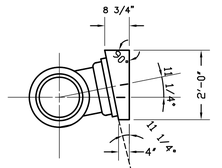
TYPE OF PIPE	PIPE SIZE	TEE	90° BEND	45° BEND, HORZ	22–1/2° BEND, HORZ	11–1/4° BEND, HORZ	45° BEND, VERT	22–1/2° BEND, VERT	11–1/4° BEND, VERT
DUCTILE IRON	4"	22	39	16	8	4	25	12	6
	6"	45	54	23	11	6	34	17	9
	8"	70	71	30	14	7	45	22	11
	10"	90	84	35	17	9	54	26	13
	12"	112	98	41	20	10	63	30	15
	14"	133	111	46	23	11	71	35	17
	16"	154	125	52	25	13	80	39	19

⑤ JOINTS' MINIMUM DISTANCE ("L" FEET) REQUIRED TO BE RESTRAINED BEYOND FITTING



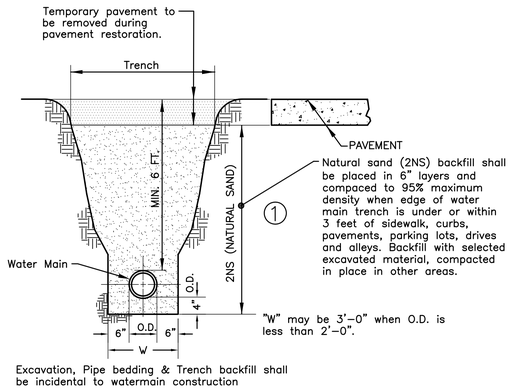
SCHEDULE OF THRUST BLOCK DIMENSIONS							
PLUG & CAP SIZE	CODE						
	A MIN.	B MIN.	C	D	E	F	G
6"	1'–11"	0'–9"	1'–2"	2'–6"	1'–3"	1'–6"	0'–9"
8"	1'–11"	0'–9"	1'–2"	3'–0"	1'–6"	2'–0"	1'–0"
12"	2'–1"	0'–9"	1'–4"	4'–0"	2'–0"	3'–0"	1'–6"
16"	2'–8"	1'–0"	1'–8"	5'–0"	2'–6"	4'–0"	2'–0"

DETAIL OF STANDARD THRUST BLOCKS FOR PLUGS & CAPS



NOTE:
Templates to be constructed of 1/2" or 3/4" plywood.

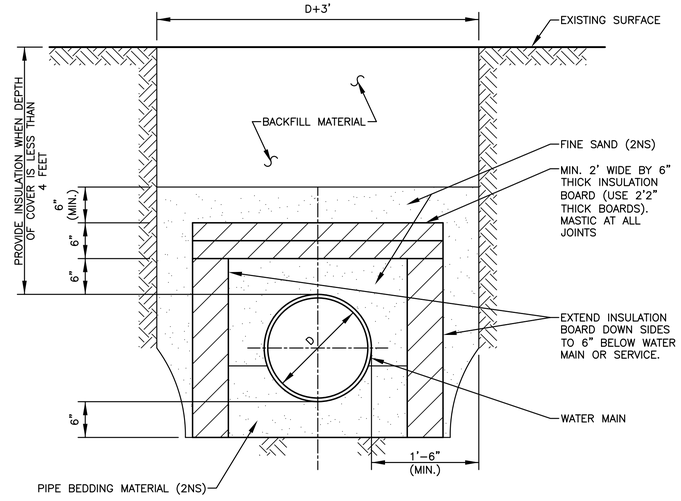
TEMPLATES FOR SETTING TEES AT 11 1/4° & 22 1/2° ANGLES



TRENCH DETAIL

NOTES

1. ALL 6", 8" AND 12" GATE VALVES SHALL HAVE MECH. JOINT FITTINGS.
2. ALL NUT, BOLTS AND WASHERS ON GATE VALVES AND FITTINGS SHALL BE CORE BLUE OR CORTEN BLUE STEEL.
3. CONCRETE FOOTING FOR GATE WELL: THE FOOTING SHALL BE CAST–IN–PLACE OR PRECAST CONCRETE. PRECAST CONCRETE BASE SECTIONS ARE ACCEPTABLE FOR GATE WELLS. CONCRETE SHALL BE POURED AGAINST UNDISTURBED GROUND. POURED CONCRETE AND MORTAR MUST BE HARD BEFORE BEING STRESSED WITH BACKFILL OR PRECAST MODULES.
   b. PRECAST CONCRETE FOOTINGS & PRECAST BOTTOMS FOR GATE WELLS SHALL BE SUPPORTED BY A COMPACTED 6" AGGREGATE BASE, COMPACTED IN PLACE.
   c. PRECAST CONCRETE FOOTINGS OR BASES SHALL BE REINFORCED WITH #4 STEEL BARS SPACED AT 1' BOTH WAYS OR WITH TWO LAYERS OF WELDED WIRE FABRIC OF EQUIVALENT CROSS SECTIONAL AREA LAID AT RIGHT ANGLES AND WIRED TOGETHER. REINFORCEMENT SHALL BE PLACED IN TOP OF FOOTING AND SHALL BE MARKED. STEEL REINFORCEMENT MAY BE OMITTED IN CAST–IN–PLACE CONCRETE FOOTINGS.
4. THE TOP PORTION OF PRECAST REINFORCED GATE WELL UNITS SHALL CONCENTRIC. THE TOP PORTION OF THE BRICK OR BLOCK GATE WELL UNITS SHALL BE CONCENTRIC.
5. PRECAST CONCRETE SECTIONS FOR GATE WELLS SHALL BE BUILT IN ACCORDANCE WITH A.S.T.M. C–478. THE WALLS OF THE PRECAST UNITS MAY HAVE A SLIGHT TAPER TO ALLOW FOR FORM REMOVAL.
6. MORTAR SHALL BE 1 PART CEMENT AND 2 PARTS N.S. SAND. PLASTER ALL BRICK & BLOCK WITH 1/2" MORTAR.
7. PLACE C.I. STEPS (EJIW 8500) IN GATE WELLS ONLY IF CALLED FOR IN SPECIFICATIONS.
8. IF FLANGE VALVES ARE SPECIFIED, LONG HUB PIPE FLANGES MUST BE POWER TIGHTENED AND REFACED AT THE FACTORY.
9. STEM NUTS ON ALL GATE VALVES INCLUDING 6" HYDRANT GATE VALVES SHALL TURN RIGHT TO OPEN.
10. OPERATING NUT ON FIRE HYDRANT SHALL TURN LEFT TO OPEN.
11. GATE WELL FRAME SHALL BE NO. 1040, E.J.I.W., BASE FLANGE TYPE., WEIGHT 230 LBS.
12. GATE WELL COVER SHALL BE TYPE C SOLID COVER WITH TWO–1" DIA. HOLES WITH CITY OF DEARBORN "LOGO", WEIGHT 145 LBS.
④ ⑤ 13. DUCTILE IRON PIPE SHALL BE DUCTILE IRON PIPE SHALL BE CLASS 54 LINED WITH STANDARD THICKNESS CEMENT MORTAR LINING SEALED WITH BITUMINOUS SEAL COAT IN ACCORDANCE WITH AWWA SPECIFICATION (104) (ANSI A21.4), DUCTILE IRON PIPE SHALL BE MANUFACTURED IN ACCORDANCE WITH AWWA SPECIFICATION (C151) & (ANSI A21.51) AND SHALL MEET STANDARD NSF 61.
14. JOINTS ON PIPES SHALL BE OF RUBBER PUSH–ON TYPE. JOINTS FOR ALL FITTINGS SHALL BE MECHANICAL JOINT.
15. FIRE HYDRANTS ARE TO BE THE NEW CITY OF DEARBORN TYPE AS MANUFACTURED BY EAST JORDAN IRON WORKS, MODEL 5BR250.
16. CASTINGS SHALL MEET THE REQUIREMENTS OF THE CURRENT SPECIFICATIONS A.S.T.M. DESIGNATION A–48 AND SHALL HAVE THE SAME MINIMUM STRENGTH AS PROVIDED FOR #30 GRAY IRON CASTINGS.
④ 17. COPPER WATER SERVICE PIPE AND FITTINGS THE WATER SERVICE LINES THAT ARE TO BE TRANSFERRED FROM THE OLD TO THE NEW WATER MAIN SHALL BE TYPE K COPPER PIPE (2" DIA. OR LESS) AND THOSE FITTINGS NECESSARY FOR THIS WORK SHALL BE MANUFACTURED BY MUELLER COMPANY, DECATUR, ILLINOIS, OR AN EQUAL APPROVED BY THE CITY OF DEARBORN WATER DEPARTMENT. IDENTIFICATION NUMBERS LISTED BELOW ARE FROM MUELLER CATALOG W103 CORPORATIONS SHALL BE H–15400 (3/4" AND 1") COPPER TO COPPER COMPRESSION COUPLINGS SHALL BE H–15403 (1–1/2" & 2") COPPER TO COPPER CURB STOP & VALVE SHALL BE MUELLER H–15204 FOR COPPER TO COPPER CURB STOP & VALVE SHALL BE MUELLER H–10051 AND H015174.
② 18. CONCRETE THRUST BLOCKS SHALL BE REQUIRED AT ALL HORIZONTAL BENDS & TEES WITH A DIMENSION AS INDICATED. CONCRETE IN THRUST BLOCKS AND CONCRETE ENCASEMENTS MAYBE CLASS 4 CONCRETE. CONCRETE ANCHORING AS SHOWN ON THE DRAWINGS SHALL BE REQUIRED FOR ALL VERTICAL BENDS.
19. MEGALUGS MAY BE ACCEPTABLE IN PLACE OF CONCRETE THRUST BLOCK IF APPROVED BY THE ENGINEER.
② 20. DUCTILE IRON WATER MAIN SHALL BE WRAPPED WITH POLYETHYLENE ENCASEMENT WITH SPECIFIED OVERLAPS.



NOTES:

1. INSULATION BOARD TO BE CLOSED CELL, EXTRUDED POLYSTYRENE FOAM MEETING ASTM 578, TYPE VI, 40 PSI COMPRESSING STRENGTH (ASTM D1621) 0.1% MAX. WATER ABSORPTION (ASTM C272).
2. BACKFILL MATERIAL AROUND INSULATION MUST BE FINE SAND FREE FROM ROOTS, ORGANIC MATTER, OT OTHER INJURIOUS MATERIALS.
3. OVERLAP ALL INSULATION BOARD JOINTS.

③ WATER MAIN TRENCH INSULATION DETAIL

WATER STANDARDS THRUST BLOCK AND TRENCH DETAILS

SCALE: HOR. NONE VERT. NONE FLD. BK SEC QUAD

DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION
CITY OF DEARBORN, MICHIGAN

DATE: 02-02-15

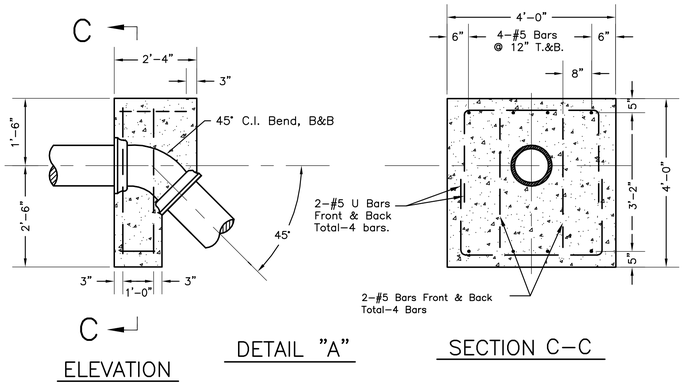
APPROVED: _____ ASST. CITY ENGINEER

APPROVED: _____ CITY ENGINEER

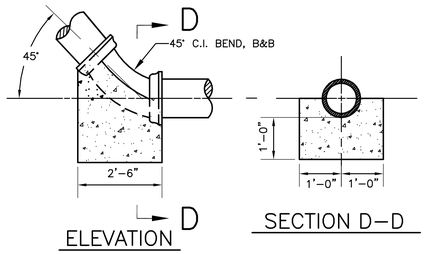
NO.	BY	REVISIONS	DATE
⑤	S.A.S.	REV. NOTE #13 & ADD NEW DETAIL	04-21-25
④	B.J.H.	REV. NOTE #13 & NOTE #17	04-05-21
③	S.A.S.	ADD TRENCH INSULATION DETAIL	09-28-20
②	G.A.V.	REV. NOTE #18 & ADD NOTE #20	09-09-14
①	J.G.S.	REV. TRENCH DETAIL	03-04-14

DESIGN _____ DRAWN _____ CHECKED _____

SHEET NO. W-2 OF _____



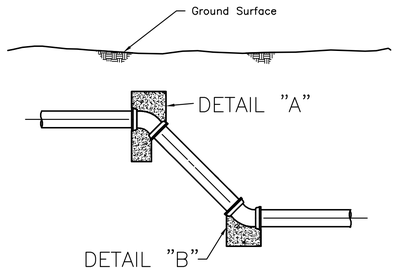
ELEVATION DETAIL "A" SECTION C–C

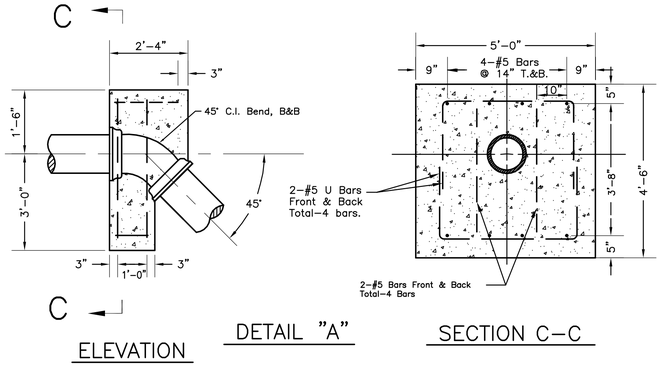


ELEVATION SECTION D–D

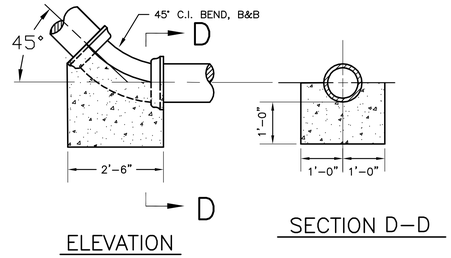
DETAIL "B"

ANCHORAGE DETAILS FOR 8"–45° VERTICAL BEND





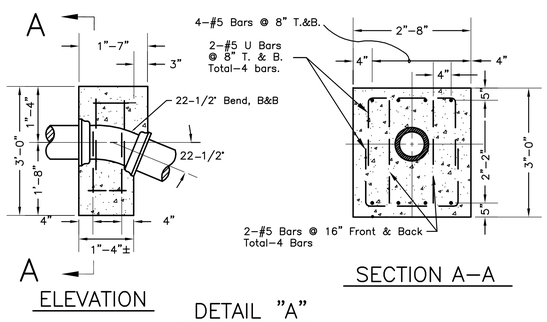
ELEVATION DETAIL "A" SECTION C–C



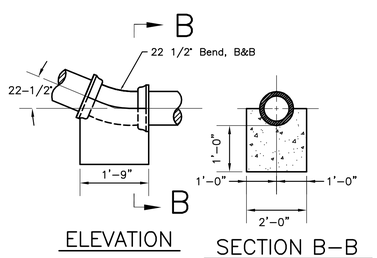
ELEVATION SECTION D–D

DETAIL "B"

ANCHORAGE DETAILS FOR 12"–45° VERTICAL BEND



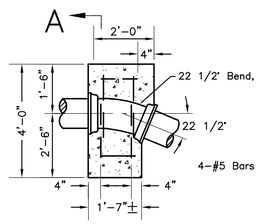
ELEVATION DETAIL "A" SECTION A–A



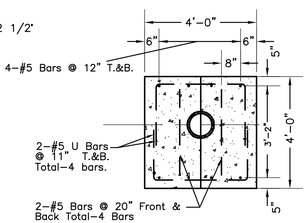
ELEVATION SECTION B–B

DETAIL "B"

ANCHORAGE DETAILS FOR 8" 22–1/2° VERTICAL BEND

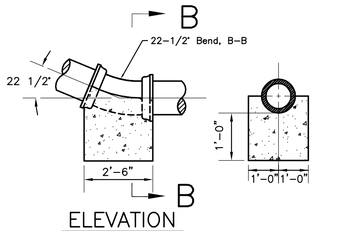


ELEVATION



SECTION A–A

DETAIL "A"



ELEVATION SECTION B–B

DETAIL "B"

ANCHORAGE DETAILS FOR 12" 22–1/2° VERTICAL BEND

WATER STANDARDS
THRUST BLOCK FOR VERTICAL BENDS 22-1/2° AND 45°

SCALE: HOR. NONE VERT. NONE FLD. BK SEC QUAD

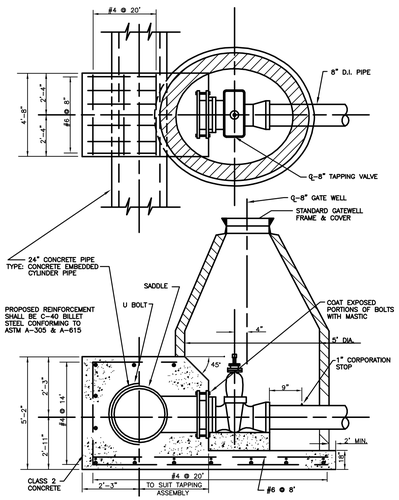
DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION
CITY OF DEARBORN, MICHIGAN

APPROVED: Asst. City Engineer
APPROVED: CITY ENGINEER
DATE: 02-02-15

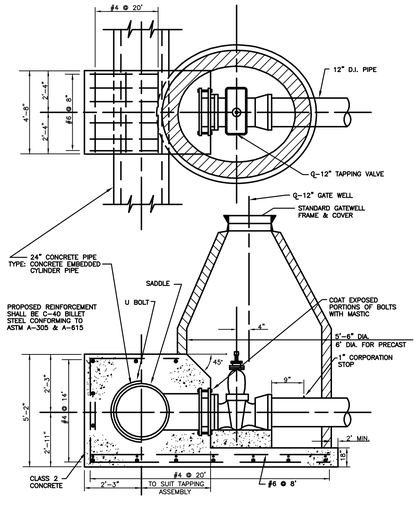
NO.	BY	REVISIONS	DATE

CHECKED DRAWN DESIGN

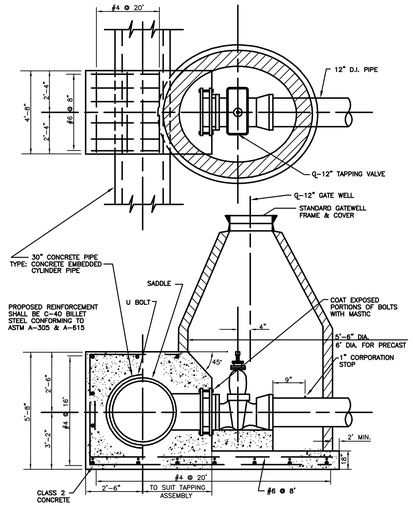
SHEET NO. W-3 OF



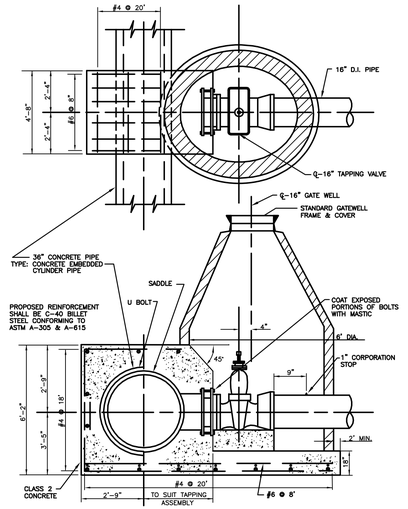
24"x8" PRESSURE TAP
VALVE & WELL ASSEMBLY



24"x12" PRESSURE TAP
VALVE & WELL ASSEMBLY



30"x12" PRESSURE TAP
VALVE & WELL ASSEMBLY



36"x16" PRESSURE TAP
VALVE & WELL ASSEMBLY

WATER STANDARDS

PRESSURE TAPS: 24"X8";24"X12";30"X12";36"X16"
TYPICAL TUNNEL CASTING FOR WATERMAIN
STANDARD TAPPING SLEEVES
VALVE & WELL ASSEMBLY

SCALE: HOR. NONE VERT. NONE | FLD. BK | SEC | QUAD

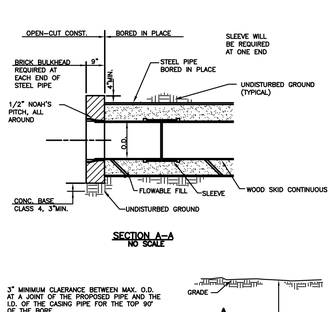
DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION
CITY OF DEARBORN, MICHIGAN

APPROVED: _____ ASST. CITY ENGINEER
APPROVED: _____ CITY ENGINEER
DATE: 02-02-15

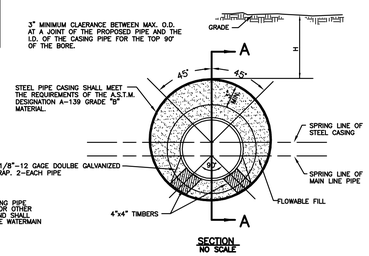
NO.	BY	REVISIONS	DRAWN	CHECKED	DATE

SHEET NO. W-4 OF ____

NOMINAL THICKNESS OF CASING PIPE REQUIRED FOR R.R. XING	
NOMINAL DIA. IN INCHES	THICKNESS IN INCHES
10 AND UNDER	0.188
12 & 14	0.250
16	0.281
18	0.312
20 & 22	0.344
24	0.375
26	0.406
28	0.438
30	0.469
32	0.500
34 & 36	0.532
38	0.562
40	0.594
42	0.625
44 & 46	0.657
48	0.688
50	0.719
52	0.750
54	0.781
56 & 58	0.812
60	0.844
62	0.875
64	0.906
66 & 68	0.938
70	0.969
72	1.000



SECTION A-A
NO SCALE



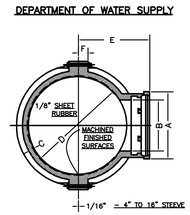
SECTION
NO SCALE

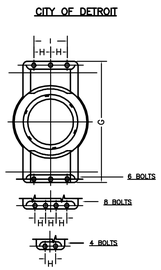
3" MINIMUM CLEARANCE BETWEEN MAX. O.D. AT A JOINT OF THE PROPOSED PIPE AND THE I.D. OF THE CASING PIPE FOR THE TOP 90° OF THE BORE.

BACKFILL
SPACE BTWEEN THE WATERMAIN AND CASING PIPE SHOULD BE FILLED WITH FLOWABLE FILL OR OTHER MATERIAL APPROVED BY THE ENGINEER AND SHALL COMPLETELY FILL ALL VOIDS BETWEEN THE WATERMAIN AND THE CASING PIPE.

ALLOWABLE HEIGHT OF COVER (H.) IN FT. FOR STEEL CASING									
WALL THICKNESS (IN.)		STEEL CASING OUTSIDE DIAMETER (IN.)							
FRACT.	DEC.	12	14	16	18	20	24	28	30	36	42
3/16	.1875	39	30	24	21	19	17	16			
1/4	.250	50	50	39	31	27	21	19	18	16	
5/16	.3125			50	48	39	28	23	21	18	17
3/8	.375				50	50	39	29	27	22	19
7/16	.4375						50	39	34	26	21
1/2	.500							50	44	31	25
9/16	.5625								50	39	30
5/8	.625									48	35
MAX. NOMINAL DIA. OF WATERMAIN (CARRIER)		8"	10"	12"	18"	20"	24"				

TYPICAL HORIZONTAL AUGER BORING
(BORE AND JACK)

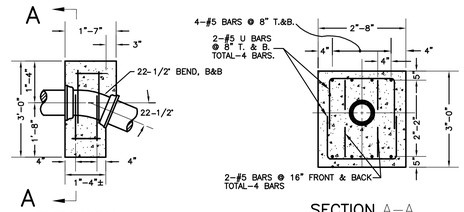




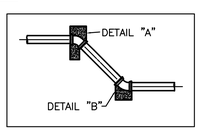
NOTE:
BOLTS TO BE SQ. HD. HEX. NUT {CADMIUM PLATE OR SHERARDIZED.
DIA. BOLT HOLE = DIA. OF BOLT + 1/8" FOR 3/4" TO 1 1/8" BOLT.
DIA. BOLT HOLE = DIA. OF BOLT + 3/16" FOR 1 1/4" AND LARGER.

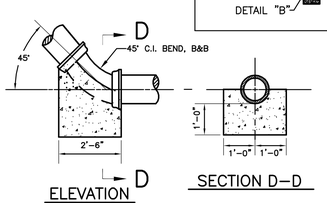
SIZE OF SLEEVE	A	B	C	D	E	F	G	H	I	NO. OF BOLTS	SIZE OF BOLTS	WT. IN LBS.
4 x 2	6 1/4	2 3/8	5/8	5 3/8	5 3/4	15/16	11 1/4	3	6 1/4	4	3/4 x 3	56
4 x 3	7 5/8	3 3/8	5/8	5 3/8	5 3/4	15/16	11 1/4	3	6 1/2	4	3/4 x 3	57
4 x 4	8 3/4	4 3/8	5/8	5 3/8	6 1/4	15/16	11 1/4	3	6 1/2	4	3/4 x 3	70
6 x 2	6 1/4	2 3/8	11/16	7 3/8	6 7/8	15/16	13 1/2	3	6 1/2	4	3/4 x 3	65
6 x 3	7 5/8	3 3/8	11/16	7 3/8	6 7/8	15/16	13 1/2	3	6 1/2	4	3/4 x 3	70
6 x 4	8 3/4	4 3/8	11/16	7 3/8	7 3/8	15/16	13 1/2	3	6 1/2	4	3/4 x 3	77
6 x 6	11 1/4	6 1/2	11/16	7 3/8	7 3/8	15/16	13 1/2	3	6 1/2	4	3/4 x 3	109
8 x 2	6 1/4	2 3/8	3/4	9 1/2	7 7/8	1 1/16	15 1/2	3	7 1/2	4	3/4 x 3 1/4	80
8 x 3	7 5/8	3 3/8	3/4	9 1/2	7 7/8	1 1/16	15 1/2	3	7 1/2	4	3/4 x 3 1/4	80
8 x 4	8 3/4	4 3/8	3/4	9 1/2	8 3/8	1 1/16	15 1/2	3	7 1/2	4	3/4 x 3 1/4	109
8 x 6	11 1/4	6 1/2	3/4	9 1/2	8 3/8	1 1/16	15 1/2	3	7 1/2	4	3/4 x 3 1/4	125
8 x 8	13 5/8	8 5/8	3/4	9 1/2	8 7/8	1 1/16	15 1/2	4	12	6	3/4 x 3 1/2	190
10 x 2	6 1/4	2 3/8	3/4	11 3/4	9	1 1/8	17 1/2	3	7 1/2	4	3/4 x 3 1/2	
10 x 3	7 5/8	3 3/8	3/4	11 3/4	9	1 1/8	17 1/2	3	7 1/2	4	3/4 x 3 1/2	119
10 x 4	8 3/4	4 3/8	3/4	11 3/4	9 1/2	1 1/8	17 1/2	3	7 1/2	4	3/4 x 3 1/2	124
10 x 6	11 1/4	6 1/2	3/4	11 3/4	9 1/2	1 1/8	17 1/2	3	7 1/2	4	3/4 x 3 1/2	143
10 x 8	13 5/8	8 5/8	3/4	11 3/4	10	1 1/8	17 1/2	4	12	6	3/4 x 3 1/2	229
10 x 10	15 7/8	10 5/8	3/4	11 3/4	10	1 1/8	17 1/2	4	12	6	3/4 x 3 1/2	243
12 x 2	6 1/4	2 3/8	13/16	13 7/8	10 1/8	1 3/16	20 3/8	4	7 1/2	4	7/8 x 3 3/4	
12 x 3	7 5/8	3 3/8	13/16	13 7/8	10 1/8	1 3/16	20 3/8	4	7 1/2	4	7/8 x 3 3/4	148
12 x 4	8 3/4	4 3/8	13/16	13 7/8	10 5/8	1 3/16	20 3/8	4	7 1/2	4	7/8 x 3 3/4	170
12 x 6	11 1/4	6 1/2	13/16	13 7/8	10 5/8	1 3/16	20 3/8	4	7 1/2	4	7/8 x 3 3/4	172
12 x 8	13 5/8	8 5/8	13/16	13 7/8	11 1/8	1 3/16	20 3/8	4	12	6	7/8 x 3 3/4	253
12 x 10	15 7/8	10 5/8	13/16	13 7/8	11 1/8	1 3/16	20 3/8	4	12	6	7/8 x 3 3/4	296
12 x 12	18 1/2	12 5/8	13/16	13 7/8	11 1/8	1 3/16	20 3/8	4	12	6	7/8 x 3 3/4	304
16 x 2	6 1/4	2 3/8	7/8	18 1/8	12 3/8	1 3/8	24 7/8	4	8 1/2	4	7/8 x 4 1/2	
16 x 3	7 5/8	3 3/8	7/8	18 1/8	12 3/8	1 3/8	24 7/8	4	8 1/2	4	7/8 x 4 1/2	255
16 x 4	8 3/4	4 3/8	7/8	18 1/8	12 7/8	1 3/8	24 7/8	4	8 1/2	4	7/8 x 4 1/2	237
16 x 6	11 1/4	6 1/2	7/8	18 1/8	12 7/8	1 3/8	24 7/8	4	8 1/2	4	7/8 x 4 1/2	266
16 x 8	13 5/8	8 5/8	7/8	18 1/8	13 3/8	1 3/8	24 7/8	4	12	6	7/8 x 4 1/2	353
16 x 10	15 7/8	10 5/8	7/8	18 1/8	13 3/8	1 3/8	24 7/8	4	12	6	7/8 x 4 1/2	408
16 x 12	18 1/2	12 5/8	7/8	18 1/8	13 3/8	1 3/8	24 7/8	4	16	8	7/8 x 4 1/2	463
16 x 16	23 3/8	16 3/8	7/8	18 1/8	14	1 3/8	24 7/8	4	16	8	7/8 x 4 1/2	

STANDARD TAPPING SLEEVE



DETAIL "A"





DETAIL "B"

ANCHORAGE DETAILS
FOR
16"-22 1/2" C.I. VERTICAL BENDS