1. All drain connection joints must be made as specified in specifications.

2. For ductile iron pipe drain connections, see sheet no. A.2.

3. For backfill of hatched support areas, use concrete, CA-11, flowable fill, or CLSM.

4. Tapered hole for details of concrete pipe sewer section of reinforced clay curves 45° vit. and 30° vit.

NOTE: HOLE PLUG LENGTHS VARIES SEE THIS SHEET.

PLAN

TYPICAL DRAIN STACKS FOR FUTURE USE

TYPICAL DRAIN STAGES FOR EXISTING DRAINS

LIFTING HOLE, TAPERED HOLE TO BE CAST IN PIPE INVERT.

NOTE: PIPE SEWER VITRIFIED CLAY STOPPER, 30° VIT. CLAY CURVE, 45° VIT. CLAY CURVE, 30° VIT. CLAY CURVE

NOTE: LIFTING HOLE PLUG DETAIL 7/3/18

STANDARD REVISIONS

DEPARTMENT OF WATER MANAGEMENT

AND SEWER TRENCH DETAIL

NOTE:

FOR DETAIL OF LIFTING HOLE, TAPERED HOLE TO BE CAST IN PIPE INVERT.

NOTE:

FOR FUTURE USE

PLANNED

REVIEWED:

CHECKED:

DESIGNED:

DRAWN:

GD, GC, SO

SUBGRADE

EMBEDMENT

STABILIZATION

GRANULAR

AGGREGATE PLACED FOR TEMPORARY BOTTOM.

NOTE:

MATERIAL IS ENCOUNTERED AT TRENCH BOTTOM.

NOTE:

STONE IS ONLY REQUIRED WHEN UNSTABLE

NOTE:

CRUSHED CONCRETE.

NOTE:

CRUSHED GRAVEL, CRUSHED STONE, OR CA-11, SSRBC, ARTICLE 1003.04.

NOTE:

SURFACE RESTORATION WILL NOT BE PAID

NOTE:

AGGREGATE PLACED FOR TEMPORARY BOTTOM.

NOTE:

MATERIAL IS ENCOUNTERED AT TRENCH BOTTOM.

NOTE:

STONE IS ONLY REQUIRED WHEN UNSTABLE
FOR BRICK SEWERS

**BRICK SEWER DRAIN CONNECTIONS**

**CONNECTION**

**PROPOSED DRAIN**

**DRAIN CONNECTION INVERT OF PROPOSED 24" OR LARGER EXISTING BRICK SEWER, OF EXISTING SEWER INVERT ELEVATION (NOT TO SCALE)**

**TO SEAL CONCRETE COLLAR AROUND END OF PIPE, AND PLACE INSERT SEGMENT OF BELL BREAK OUT HOLE, 2'-0" GROUND GRADE**

**GROUND GRADE. MAXIMUM OF 8' BELOW MINIMUM OF 7' AND A ELEVATION THAT IS A CONSTRUCTED TO AN FUTURE DRAIN SHOULD BE THE OPENING FOR THE BE MORTARED IN PLACE. VIT. CLAY STOPPER TO EARTH, AS REQUESTED BY CDWM. BAR DRIVEN INTO UNDISTURBED BY "U" SHAPED REINFORCED (OPTIONAL) TOP ANCHORED PIPE (LENGTH VARIES) OF DUCTILE IRON ONE FULL LENGTH OF DUCTILE IRON EXTRA STRENGTH CLOSURE PIECE DOUBLE HUB.**

**FOR MONOLITHIC CONCRETE SEWERS**

IN MONOLITHIC CONCRETE SEWER, FORM A TAPERED HOLE FOR EXISTING 6", 8", & 10" DRAIN CONNECTIONS.

**FOR REDUCED CONCRETE PIPE SEWERS**

OF VITRIFIED CLAY PIPE DRAIN CONNECTION AND DRAIN STACK CONSTRUCTION, SEE SHEET NO. A.1.

2. CONNECTIONS AND STACKS SHOWN MUST BE USED FOR 6", 8", & 10" DRAINS ONLY.

3. FOR GRANULAR EMBEDMENT, USE CA-11, CRUSHED GRAVEL, CRUSHED STONE, OR CRUSHED CONCRETE.

4. FOR TRENCH BACKFILL, REFER TO IDOT SSRBC, ARTICLE 1003.04.

5. DUCTILE IRON PIPE MUST BE BELL END WITH PUSH-ON JOINTS CONFORMING TO ANSI SPECIFICATIONS AGNIR WITH CLASS B TIGHTNESS.

**NOTES:**

- **DUCTILE IRON PIPE** MUD BE BELL END WITH PUSH-ON JOINTS CONFORMING TO ANSI SPECIFICATIONS AGNIR WITH CLASS B TIGHTNESS.
- **CONNECTIONS AND STACKS SHOWN MUST BE USED FOR 6", 8", & 10" DRAINS ONLY.**
- **FOR VITRIFIED CLAY PIPE DRAIN CONNECTION AND DRAIN STACK CONSTRUCTION, SEE SHEET NO. A.1.**
- **FOR TRENCH BACKFILL, REFER TO IDOT SSRBC, ARTICLE 1003.04.**
- **FOR GRANULAR EMBEDMENT, USE CA-11, CRUSHED GRAVEL, CRUSHED STONE, OR CRUSHED CONCRETE.**

**FOR BRICK SEWERS**

**DUCTILE IRON PIPE DRAIN CONNECTIONS**

**BRICK SEWER DRAIN CONNECTIONS**

**STANDARD REVISIONS**

**PERCENT COMPLETE**

**DATE**

**DESCRIPTION**

**CITY OF CHICAGO**

**DEPARTMENT OF WATER MANAGEMENT**

**BUREAU OF ENGINEERING SERVICES**

**CDWM_Details.cel 9/20/2017 11:26:35 AM**
SPECIAL DRAINAGE STRUCTURES
FOR PUBLIC STREETS AND ALLEYS

TOP SLAB IN WALLS &
10" LENGTH 12" O.C./E.W.
#4 REBAR (TOP & BOTTOM)
2" KEYWAY

MODIFICATION LIMITATIONS DICTATE USED WHEN COVER CONFIGURATIONS TO BE TWO DIFFERENT JOINT

NOTE:
FOR CATCH BASINS
STANDARD FLAT TOP SLAB
FOR PUBLIC STREETS AND ALLEYS
SPECIAL DRAINAGE STRUCTURES

8" REINFORCED
5" PRECAST OR
WELDED WIRE FABRIC

NOTE:
FLAT TOP SLAB APPLICATION CAN ONLY BE USED WITH WRITTEN PERMISSION FROM CDWM.
USE LATEST DETAIL 4602601

PRECAST REINFORCED
CONCRETE FLAT SLAB TOP
STANDARD 602601-03
### Schedule of Reinforcement

| Size   | Type   | Size   | Length | Details | A | B | C | D | E | F | G | H | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | AA | BB | CC |
|        |        |        |        |         |    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |

### Notes

- **6" Minimum Granular Embedment Under All Precast Manhole Bases**
- For Type "A" Manholes for Sewers 24" Dia. and Smaller

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**Bureau of Engineering Services**

**Department of Water Management**

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**CDWM Details.cel 9/5/2017 10:26:43 AM**
REINFORCEMENT BAR

BENDING DIMENSIONS

NOTES:

1. All dimensions are to the nearest inch.

2. Bending radii are to the outside of the bar.

3. Numbers in circles denote bar type.

PLACING OF CONCRETE: Concrete must be placed in accordance with the method outlined in the City of Chicago Standard Specifications.

CONSTRUCTION JOINTS: Construction joints are to be made in accordance with the method outlined in the specifications.

CONCRETE PROTECTION FOR REINFORCEMENT: All reinforcing steel must be protected by a minimum of 3" of concrete at exterior surfaces and 4" at interior surfaces. Concrete must be placed in such a way that the reinforcing steel is not exposed or damaged.

REINFORCING STEEL: All reinforcing bars must be accurately placed and securely supported by proper supports, spacers, or anchorage. All laps in reinforcing steel must be based upon the 1986 ACI Building Code.

THE FOLLOWING ABBREVIATIONS ARE USED TO INDICATE THE LOCATION OF REINFORCING BARS:

- T: Top
- B: Bottom
- F: Far Face
- N: Near Face
- O: Outside Face
- E: Each Face
- L: Each Lap
- W: Each Way

PLACING BARS SUPPORTS: All reinforcing bars must be supported, anchored, and tied in accordance with the recommended practice for placing reinforcing bars, as outlined by the Concrete Reinforcing Steel Institute.
BRANCH MATERIALS MUST MATCH $D_a$.

AT-TYPICAL 4 OPENING TYPE B MANHOLE

ID PIPE (in.) | MATERIAL | O2 PIPE (in.) | $D_{max}$ (in.)
---|---|---|---
12 | VCP | 14.39 | 15.06
15 | VCP | 17.88 | 18.68
18 | VCP | 21.36 | 22.06
24 | VCP | 25.84 | 26.54
8 | DP | 0.06 | 0.06
10 | DP | 1.13 | 1.13
12 | DP | 1.30 | 1.30
14 | DP | 1.53 | 1.53
16 | DP | 1.75 | 1.75
18 | DP | 1.97 | 1.97
20 | DP | 2.19 | 2.19
24 | DP | 2.88 | 2.88
27 | DP | 3.36 | 3.36
30 | DP | 3.84 | 3.84
33 | DP | 4.33 | 4.33
36 | DP | 4.82 | 4.82
42 | DP | 5.50 | 5.50
48 | DP | 6.18 | 6.18

Notes:
1. If the pipe class and wall size is not shown on this table, then $D_{max}$ = $00$ pipe = 4".
2. $D_{max}$ indicates the maximum size of branch opening to be cast or cut into structure.

Typical 4 opening Type B Manhole
FOR CONCRETE PIPE SEWERS
24" DIA. TO 48" DIA.

Note: For Design only- Use 12" Drop pipe for the following depths of DWF:
6" DWF-42" lateral
7" DWF-36" lateral
8" DWF-24" lateral

Optional overflow pipe
DESCRIPTION

BUREAU OF ENGINEERING SERVICES

DATE

NOTE: Elevation B1 >= Elevation D

LIMITS OF PAYMENT FOR MANHOLE

PRECAST MANHOLE

LOCATION

SECTION A-A

NO. SHEET

SEC. 2'-0" 6'-6"

ITEM

MANHOLE FRAME

FOR CONCRETE PIPE SEWERS

12" DIA. TO 48" DIA.

SEWER EXISTING

ELEVATION

CAST-IN-PLACE PRECAST CEMENT

OF VB OR VM WALL WITH V, WALL OR WALL C WITH CIRCULAR TABLE III, IV CULVERT STORM DRAIN, AND SPECIFICATIONS FOR "REINFORCED CONCRETE CLASS III, IV AND V REINFORCED CONCRETE"

ALL PIPE AND FITTINGS 24 INCHES IN 8" DWF-24" LATERAL 7" DWF-36" LATERAL 6" DWF-42" LATERAL DEPTHS OF DWF:

FITTINGS 21" AND UNDER ARE STANDARD

NOTE:

CAST-IN-PLACE PRECAST CEMENT

DIA.

LADDER RUNG ON 16" CENTERS

SEE SHEET NO. A.22 FOR RUNG TYPES

LADDER OR ELLIPTICAL REINFORCEMENT

AND VB, WALL B OR WALL C WITH CIRCULAR TABLE III, IV

FOR VITRIFIED CLAY PIPE SEWERS

SEE SHEET NO. A.6 FOR DETAILS

PRECAST MANHOLE

CHICAGO STANDARD

PERCENT COMPLETE

CHECKED:

DESIGNED:

DRAWN:

DEPARTMENT OF WATER MANAGEMENT
BUREAU OF ENGINEERING SERVICES

DATE

DESCRIPTION

CDWM_Details.cel 7/3/2018 2:46:31 PM

$ D A T E $

COLLAR AROUND
AND PLACE CONCRETE
CORE HOLE, INSERT
FURNISHED AT THE UNIT PRICE OF THE WORK.

SCOPE OF THE WORK, HOWEVER, CONTRACTOR WILL BE PAID FOR THE QUANTITY ACTUALLY
VARIATIONS SHALL NOT BE CAUSE FOR ADDITIONAL COMPENSATION FOR A CHANGE IN THE
NECESSARY APPROVED ADJUSTMENTS PRIOR TO CONSTRUCTION OR ORDERING MATERIALS. SUCH
RESPONSIBILITY TO VERIFY SUCH DIMENSIONS AND DETAILS IN THE FIELD AND MAKE
SUBJECT TO NOMINAL CONSTRUCTION VARIATIONS. IT SHALL BE CONTRACTOR'S
TIMES. PLAN DIMENSIONS AND DETAILS RELATIVE TO EXISTING STRUCTURE SHALL BE
TO PREVENT THE BOTTOM OF ALL EXCAVATIONS FROM FREEZING OR FLOODING AT ALL
DURING CONSTRUCTION OPERATIONS UNTIL BACKFILL IN PLACE. PROVISIONS SHALL BE MADE
PRIOR BREAKING INTO EXISTING BRICK SEWER. ALL EXCAVATION SHALL BE KEPT DEWATERED
BE MAINTAINED IN SERVICE AT ALL TIMES. SUBMIT MEANS OF FLOW DIVERSION FOR REVIEW
7.   CONTRACTOR SHALL DIVERT ALL FLOW FROM THE EXISTING SEWER PRIOR TO
SEWER DURING CONSTRUCTION FOR REVIEW PRIOR TO CONSTRUCTION. ANY DAMAGE TO
ILLINOIS LICENSED STRUCTURAL ENGINEER, SHOWING TEMPORARY BRACING FOR THE EXISTING
SEWER DURING CONSTRUCTION. SUBMIT DESIGN AND DETAILS, SEALED AND SIGNED BY AN
ADEQUATELY BRACE OR SHORE EXISTING SEWER IF REQUIRED TO MAINTAIN INTEGRITY OF
EXISTING PIPE END TO PROVIDE FLUSH BUTT JOINT, INSTALL REBAR, AND PLACE CONCRETE
5.  CONCRETE COLLARS SHALL BE USED AT ALL EXISTING/PROPOSED PIPE CONNECTIONS. TRIM
BARS: 2"
A.)  CONCRETE CAST AGAINST PERMANENTLY EXPOSE EARTH: 3"
B.)  ALL OTHER REINFORCING
AND ARTICLE 1006.10.
3.  ALL EPOXY COATED REINFORCEMENT BARS SHALL CONFORM TO IDOT SSRBC SECTION 508,
COMPRESSIVE STRENGTH OF 3500 PSI.

1.  ALL ITEMS AND MATERIALS SHALL CONFORM TO THE LATEST IDOT SSRBC SPECIFICATIONS,
UNLESS OTHERWISE NOTED IN SUPPLEMENTAL SPECIFICATIONS FOR THE SPECIFIC PROJECT

EXAMPLE TYPICAL CONNECTION DETAIL

H
Y
T
D
IA

ADDRESS

ARCH-PIPE SEWER

12" MIN.

MINIMUM
6" EMBEDMENT

SEWER GROUT

COLLAR TO PIPE.

DETAILS)

REINFORCEMENT
(SEE BELOW FOR

CONNECTION DETAILS)

OF THE CONNECTION SIZE.

CONNECTIONS TO ARCH PIPES SHALL BE NO
CENTER TO CENTER SPACING OF LATERAL
SHALL BE EQUAL TO OR LESS
DIAMETER OF THE CONNECTION
DIAMETER OF THE

MIN. 1'-0"

BELL END OF PIPE, AND
PLACE CONCRETE COLLAR
INVERT ELEVATION
AT SPRINGLINE
CONNECTION

S
D
W
Y
T
H

PIPE TO PIPE
BARS
BULKHEAD
4 EACH #5 U-BARS
3 #5 SPACED EQUALLY
2-#5 EQUALLY

CONCRETE COLLAR
REINFORCEMENT - SECTION
(SEE BELOW FOR CONCRETE COLLAR
REINFORCEMENT BARS)

EXAMPLE CONCRETE COLLAR
REINFORCEMENT - SECTION
(NOT TO SCALE)

BARS
BULKHEAD
4 EACH #5 U-BARS
3 #5 SPACED EQUALLY
2-#5 EQUALLY

CONCRETE COLLAR
REINFORCEMENT - SECTION
(SAME DIAMETERS)

12" MIN.

MINIMUM
6" EMBEDMENT

SEWER GROUT

COLLAR TO PIPE.

DETAILS)

REINFORCEMENT
(SEE BELOW FOR

CONNECTION DETAILS)

OF THE CONNECTION SIZE.

CONNECTIONS TO ARCH PIPES SHALL BE NO
CENTER TO CENTER SPACING OF LATERAL
SHALL BE EQUAL TO OR LESS
DIAMETER OF THE CONNECTION
DIAMETER OF THE

MIN. 1'-0"

BELL END OF PIPE, AND
PLACE CONCRETE COLLAR
INVERT ELEVATION
AT SPRINGLINE
CONNECTION

S
D
W
Y
T
H

PIPE TO PIPE
BARS
BULKHEAD
4 EACH #5 U-BARS
3 #5 SPACED EQUALLY
2-#5 EQUALLY

CONCRETE COLLAR
REINFORCEMENT - SECTION
(SEE BELOW FOR CONCRETE COLLAR
REINFORCEMENT BARS)

EXAMPLE CONCRETE COLLAR
REINFORCEMENT - SECTION
(NOT TO SCALE)

BARS
BULKHEAD
4 EACH #5 U-BARS
3 #5 SPACED EQUALLY
2-#5 EQUALLY

CONCRETE COLLAR
REINFORCEMENT - SECTION
(SAME DIAMETERS)
1. If B < 4 feet, then use a flat top slab catch basin as necessary.

2. If B < 4 feet, then use a flat top slab half-trap.

3. Min. orifice size = 2.5" dia.

4. For granular embedment, use CA-11, crushed gravel, 100% of trench, per RCP standard.

5. For stabilization stone, 12" of CA-1 stone is only allowed in private sites & alleys. Only the surrounding pipe should be CA-7 aggregate fill, should be CA-7 aggregate fill, 2" min. of 4", 2" min. of 4", and should be CA-7 aggregate fill.

6. For 4' dia. inf. pipe, 4' dia. inf. pipe, use a vortex restrictor as needed.

7. The half-trap elevation A. or underdrain must be at or above the half-trap elevation A.

8. Note: The invert on inflow pipe.

9. The invert on inflow pipe.

10. Notes: Plate must be 4" x 16" x 16" plate.

11. Plate rests on the adjustment ring.

12. The adjustment ring embedment.

13. The half-trap elevation A. or underdrain must be at or above the half-trap elevation A. upon tightening of the 2 bolts on the face of the restrictor.

14. Insert the restrictor with the opening down. Upon tightening of the 2 bolts on the face of the restrictor.

15. Verify that a tight fit is made. Pull on restrictor to test fit.

SECTION-A

COPOLYMER POLYPROPYLENE PLASTIC BAR REINFORCEMENT

REDUCED SOLID ALUMINUM

RECTANGULAR STEP LADDER RUNG

FOR USE ONLY IN 48” DIAMETER AND LARGER MANHOLES.

NOTES:

1. VERTICAL SPACING = 16” O.C. ON VERTICAL WALL ONLY.

2. STEPS SHALL MEET THE REQUIREMENTS OF ASTM C478 IN ADDITION TO A HORIZONTAL PULL-OUT LOAD OF 1000 LBS. WHEN INSTALLED.

3. ALL STEPS SHALL BE VERTICALLY ALIGNED IN A STRAIGHT LINE.

4. MINIMUM CONCRETE STRENGTH MUST BE 3000 PSI

5. HOLES- PREFORMED/DRILLED
   A. HOLES MUST BE PARALLEL
   B. HOLES MUST BE 10” CENTERED, 1” DIAMETER
   C. MINIMUM DEPTH= 3 1/2” TO 3 3/4”
ABANDON CATCH BASIN

- Remove frame, lid, and adjusting rings.
- Remove cone section.
- Fill with sand or CLSM/flowable fill.
- Seal all openings with brick and mortar.

ABANDON MANHOLE

- Remove frame, lid, and adjusting rings.
- Remove cone section.
- Reinforced flat top slab (see note below).
- Use mortar or sealer.

NOTE

- Use mortar or sealer.
- Fill with sand or CLSM/flowable fill.
- Fill with CLSM/flowable fill to 6" above sewer crown.

IN LANDSCAPE AREA

- Seal all openings with brick and mortar if pipe to be abandoned is less than 24".

IN PAVEMENT AREA

- Maintain flow if pipe is not abandoned.
- Use mortar or sealer.

NOTE

- Reinforced flat top slab.
- See DOT STD. #2603-03 or current modified with no access hole.

ABANDONED SEWER STRUCTURE

TRENCH BACKFILL

- Street classification type B, 6" min.
- HMA surface course with "0", 1 1/2" type to meet street classification.
- P.C. concrete base course, depth base to grade.
- Sub-base granular material, type B, 6" min.
- 4" topsoil.
- Trench backfill.
- Use mortar or sealer.

DETAILS

- Depth base to grade.
- Mix "D", 1", HMA surface course.
- Drilled and grouted into existing base, 30" C/C as required (TYP).
- #5 tie bars, 18" long.
- Reinforced flat top slab.
- Use mortar or sealer.