# CITY OF CHISAGO CITY
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# CITY OF CHISAGO CITY

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IMPROVED PIPE FOUNDATION MATERIAL (3149.2H) CONSIDERED INCIDENTAL TO THE SPECIFIED GRANULAR BORROW MATERIAL (3149.2B1) IN THIS AREA

IMPROVED PIPE FOUNDATION MATERIAL

GOOD SOILS

COARSE FILTER

AGGR. MNDOT SPEC.

3149.2H

IMPROVED PIPE FOUNDATION 6"
PAY DEPTH INCREMENTS TYP.

DIA+12" MIN.

DIA

"DIA" DENOTES OUTSIDE DIAMETER OF PIPE

COMPACTED BACKFILL

GRANULAR BORROW
MNDOT SPEC.
3149.2B1

12"

6"

DIA+12" MIN.

DIA

"DIA" DENOTES OUTSIDE DIAMETER OF PIPE

IMPROVED PIPE FOUNDATION MATERIAL

POOR SOILS

STANDARD DETAILS

PIPE FOUNDATION & BEDDING METHODS FOR PVC

1/2019

BEd-1
"DIA" denotes outside diameter of pipe.

**CLASS B**

- Load factor: 1.9
- Hand shaped from angular bedding material.

**CLASS C-1**

- Load factor: 1.5
- Hand shaped from firm undisturbed soil.

**CLASS C-2**

- Load factor: 1.5
- Hand shaped from angular bedding material.

### COMPANY NAME

**PIPE FOUNDATION & BEDDING METHODS FOR RCP OR DIP**

**Revised**

1/2019

**Standard Plate No.**

BED-2
MATERIAL IN THIS AREA SHALL BE CONSIDERED INCIDENTAL FOR PIPE SPECIFIED WITH CLASS B BEDDING.

COMPACTED BACKFILL

COARSE FILTER AGGR. MNDOT SPEC. 3149.2H

"DIA" DENOTES OUTSIDE DIAMETER OF PIPE

DIA + 12" MIN.

DIA

IMPROVED PIPE FOUNDATION 6" PAY DEPTH INCREMENTS TYP.
NOTE:
The MACHINE SLICED METHOD (THIS DETAIL) IS THE STANDARD SILT FENCE INSTALLATION METHOD. HEAVY-DUTY (ERO-1B) OR STANDARD (ERO-1C) SILT FENCE INSTALLATION METHODS SHOULD ONLY BE USED WHEN APPROVED OR DIRECTED BY THE CITY.

A) COMPACTION:
AFTER "SLICING" IN THE FABRIC AND BEFORE INSTALLATION OF STEEL POSTS, DRIVE INSTALLATION EQUIPMENT OVER THE "SLICE" WHILE FABRIC IS LAYING ON THE GROUND. THEN INSTALL STEEL POSTS AND PULL UP FABRIC TO ATTACH AT A UNIFORM HEIGHT.
STEEL FENCE POST (T-POST), MINIMUM 5' LONG, 6' MAXIMUM SPACING.

POST NOTCHES TO FACE AWAY FROM FABRIC.

ATTACH FABRIC TO POST WITH MINIMUM 3 ZIP TIES (50 LB. TENSILE) PER POST IN TOP 8" OF FABRIC.

LAY FABRIC/WIRE MESH IN THE TRENCH, BACKFILL WITH NATURAL SOIL, AND COMPACT WITH MACHINE DRIVEN VIBRATORY PLATE OR LIGHT EQUIPMENT PRIOR TO PLACEMENT OF THE POSTS.

DIRECTION OF SURFACE FLOW

EXTEND WIRE MESH INTO TRENCH

WIRE MESH REINFORCEMENT, STD. FIELD FENCE, MIN 30" HIGH, MAX MESH SPACING 6" AND MIN 14 1/2 GAUGE WIRE.

GEOTEXTILE FABRIC PER MNDOT TABLE 3886-1 (HEAVY DUTY) - OVERLAP TOP 6" OF FABRIC AND FASTEN TO WIRE MESH AT 2' INTERVALS WITH RINGS OR WIRE TIES.

ATTACH WIRE MESH TO POSTS WITH MINIMUM 3 U-SHAPED WIRE FASTENERS PER POST.

LAY FABRIC/WIRE MESH IN THE TRENCH, BACKFILL WITH NATURAL SOIL, AND COMPACT WITH MACHINE DRIVEN VIBRATORY PLATE OR LIGHT EQUIPMENT PRIOR TO PLACEMENT OF THE POSTS.

24" MINIMUM POST EMBEDMENT

NOTE:
DUAL PURPOSE USE OF HEAVY DUTY FENCE FOR PERIMETER CONTROL AND CURB PROTECTION REQUIRE STEEL POSTS ALTERNATING ON BOTH SIDES OF FABRIC WITH 4' SPACING. SEE LAND DISTURBANCE PERMIT.

NOTE:
HEAVY DUTY SILT FENCE FOR CURB PROTECTION REQUIRE POSTS TO BE INSTALLED ON HOUSE SIDE OF FABRIC.
STEEL FENCE POST (T-POST), MINIMUM 5' LONG, 6' MAXIMUM SPACING.

Lay fabric in the trench, backfill with natural soil, and compact machine driven vibratory plate or with light equipment prior to placement of the posts.

Attach fabric to post with minimum 3 zip ties (50 lb. tensile) per post in top 8" of fabric.

Monofilament geotextile fabric per MNDOT Table 3886-1 (machine sliced).

Post notches to face away from fabric.

Direction of surface flow

24" minimum post embedment
OVERLAP END JOINTS MINIMUM OF 6" AND STAPLE OVERLAP AT 1.5' INTERVALS.

OVERLAP LONGITUDINAL JOINTS MINIMUM OF 6"

STAPLE DENSITY SHALL BE A MINIMUM OF 3 U-SHAPED 8", 11 GAUGE METAL STAPLES PER SQUARE YARD (THIS MAY VARY AS DIRECTED BY THE CITY).

ANCHOR TRENCH
1. DIG 6" X 6" TRENCH
2. LAY BLANKET IN TRENCH
3. STAPLE AT 1.5' INTERVALS
4. BACKFILL WITH NATURAL SOIL AND COMPACT
5. BLANKET LENGTH SHALL NOT EXCEED 100' WITHOUT AN ANCHOR TRENCH

ANCHOR TRENCH (SEE DETAIL AND NOTES BELOW)
NOTES:
- DOUBLE SILT CURTAINS SHOULD BE SPACED 10' APART.
- CURTAIN LENGTH TO MATCH BOTTOM PROFILE AS CLOSELY AS POSSIBLE.
WOODEN LATH SHALL BE NAILED SECURELY TO THE POST MEMBER TO SECURE FILTER FABRIC.

2" X 4" X 2.5' LONG WOOD POSTS, 8 REQ'D.

2" X 4" HORIZONTAL MEMBERS CONTINUOUS AROUND TOP AND BOTTOM. FASTENED TO EACH POST USING 2-20D COMMON NAILS

MONOFILAMENT GEOTEXTILE FABRIC AS PER MNDOT TABLE 3886-1 (MACHINE SLICED). ADDITIONAL 8-10" OF FABRIC FLAP AT BOTTOM OF BOX

8-10" FABRIC FLAP EXTENDING BEYOND BOTTOM 2"x4" - BURY UNDER ROCK TO PREVENT UNDERWASHING

1 1/2" WASHED ROCK 1' DEEP X 1' WIDE

NOTES:
CONTRACTOR SHALL CONSTRUCT SILT BOX TO FIT AROUND THE INLET STRUCTURE WITH 6" MINIMUM CLEARANCE TO EDGES OF STRUCTURE. SILT BOX TO BE PLACED ON AN EVEN SURFACE 6" BELOW STRUCTURE OPENING. TOP OF SILT BOX TO EXTEND 18" MINIMUM ABOVE EXISTING GRADE.
PROPOSED CURB = DIRECTION OF SURFACE FLOW

8-12" MINIMUM DEPTH

1 1/2" WASHED GRAVEL FILTER

AGGREGATE BASE

IN PLACE CATCHBASIN

STEEL PLATE

AGGREGATE BACKFILL

STANDARD DETAILS
INLET PROTECTION - ROCK FILTER FOR CATCH BASIN DURING ROAD CONSTRUCTION

Revised
1/2019
ER0-4B
WIMCO ROAD DRAIN CG-23* HIGH FLOW INLET PROTECTION CURB AND GUTTER MODEL OR CITY APPROVED EQUAL.

* FOR THE NEW R-3067-VB STANDARD CASTING, INSTALL WIMCO ROAD DRAIN CG-3290 OR CITY APPROVED EQUAL.
NOTES:
CONTRACTOR SHALL CONSTRUCT SILT BOX TO FIT AROUND THE INLET STRUCTURE WITH 6" MINIMUM CLEARANCE TO EDGES OF STRUCTURE. SILT BOX TO BE PLACED ON AN EVEN SURFACE 6" BELOW STRUCTURE OPENING. TOP OF SILT BOX TO EXTEND 18" MINIMUM ABOVE EXISTING GRADE.

WOODEN LATH SHALL BE NAILED SECURELY TO THE POST MEMBER TO SECURE FILTER FABRIC.

2" X 4" X 2.5' LONG WOOD POSTS, 8 REQ'D.

2" X 4" HORIZONTAL MEMBERS CONTINUOUS AROUND TOP AND BOTTOM. FASTENED TO EACH POST USING 2-20D COMMON NAILS

MONOFILAMENT GEOTEXTILE FABRIC AS PER MNDOT TABLE 3886-1 (MACHINE SLICED). ADDITIONAL 8-10" OF FABRIC FLAP AT BOTTOM OF BOX

2'-6"

8-10" FABRIC FLAP EXTENDING BEYOND BOTTOM 2"x4" - BURY UNDER ROCK TO PREVENT UNDERWASHING

1 1/2" WASHED ROCK 1' DEEP X 1' WIDE

STANDARD DETAILS
INLET PROTECTION -SILT BOX FOR BEEHIVE CASTING

1/2019 ERO-4D
6" X 6" TRENCH WITH LEADING EDGE OF TYPE IV GEOTEXTILE FABRIC STAPLED AT 4' INTERVALS AND BACKFILLED WITH NATURAL SOIL.

NOTE: POINT 1 MUST BE A MINIMUM OF 6" HIGHER THAN POINT 2 TO ENSURE THAT WATER FLOWS OVER THE DITCH CHECK AND NOT AROUND THE ENDS.

DITCH CHECK SPACING
(USE FOR DETAILS ERO-5B AND 5C)

<table>
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<tr>
<td>(%)</td>
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<tr>
<td>2</td>
<td>100</td>
</tr>
<tr>
<td>4</td>
<td>75</td>
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<tr>
<td>10</td>
<td>25</td>
</tr>
<tr>
<td>10+</td>
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DITCH CHECK -3D VIEW FOR 5B, 5C AND SPACING

STANDARD DETAILS

CHISAGO CITY

DITCH CHECK -3D VIEW FOR 5B, 5C AND SPACING

Revised
1/2019
ERO-5A
I. ROCK WEEPER

MNDOT TYPE 9 MULCH (1 1/2" WASHED ROCK)

DIRECTION OF SURFACE FLOW

TYPE IV GEOTEXTILE FABRIC ANCHORED IN 6" X 6" TRENCH WITH 6", 11 GAUGE METAL STAPLES AT 1' INTERVALS.

STAPLE DOWNSTREAM SIDE OF FABRIC AT 2' INTERVALS

II. BIO WEEPER

MNDOT TYPE 9 MULCH (1 1/2" WASHED ROCK)

DIRECTION OF SURFACE FLOW

TYPE IV GEOTEXTILE FABRIC ANCHORED IN 6" X 6" TRENCH WITH 6", 11 GAUGE METAL STAPLES AT 1' INTERVALS.

6" DIA. WATTLE WITH MINIMUM 24" SURVEY LATH STAKED 2' O.C. ALONG WATTLE LENGTH.
I. SMALL CHECK DAM

MNDOT CLASS II RIP RAP

DIRECTION OF SURFACE FLOW

TYPE IV GEOTEXTILE FABRIC ANCHORED IN 6" X 6" TRENCH WITH 6", 11 GAUGE METAL STAPLES AT 4' INTERVALS.

STAPLE DOWNSTREAM SIDE OF FABRIC AT 2' INTERVALS

II. LARGE CHECK DAM

MNDOT CLASS III RIP RAP

DIRECTION OF SURFACE FLOW

TYPE IV GEOTEXTILE FABRIC ANCHORED IN 6" X 6" TRENCH WITH 6", 11 GAUGE METAL STAPLES AT 4' INTERVALS.

STAPLE DOWNSTREAM SIDE OF FABRIC AT 2' INTERVALS
MOUNT BOARD WITH LAG BOLTS THROUGH TRASH GUARD MOUNTING HOLES.

LENGTH OF NOTCH NOT TO EXCEED 33% OF PIPE DIAMETER AND NEVER MORE THAN 12".

WEIR (2" x VARIABLE HEIGHT) NOT MORE THAN 33% OF PIPE DIAMETER AND NEVER MORE THAN 12".

NOTE:
1" NOTCH FOR WEIRS 4"-6" HIGH
2" NOTCH FOR WEIRS 6"-12" HIGH
BIOROLL OR ROCK WEIR

6" OR 12" BIOROLL INSIDE TRASH GUARD

TRASH GUARD

INVERT OF FES

FASTEN FABRIC TO TRASH GUARD

6"-12" OF 1\(\frac{1}{2}\)" WASHED ROCK OVER MONOFILAMENT GEOTEXTILE FABRIC INSIDE TRASH GUARD

STANDARD DETAILS
PIPE CHECK
BIO ROLL WEIR & ROCK WEIR

1/2019
ERO-6B
WASHED ROCK PER SPECIFICATIONS

18" MINIMUM CUT OFF BERM TO MINIMIZE RUNOFF FROM SITE

NOTES:
1. FILTER FABRIC SHALL BE PLACED UNDER ROCK TO STOP MUD MIGRATION THROUGH ROCK.
2. ENTRANCE MUST BE MAINTAINED REGULARLY TO PREVENT SEDIMENTATION ON PUBLIC ROADWAYS. FUGITIVE ROCK WILL BE REMOVED FROM ADJACENT ROADWAYS DAILY OR MORE FREQUENTLY AS NECESSARY.
3. WOOD CHIPS WILL NOT BE ALLOWED

2½" - 1" ROCK RESIDENTIAL 8" MINIMUM DEPTH
2" - 3" ROCK COMMERCIAL/INDUSTRIAL 8" MINIMUM DEPTH
NOTE:
UTILITIES PLACED IN JOINT 3' TRENCH WITH 12' MIN. SEPARATION. JOINT TRENCH TO BE 0'-5' BEHIND R.O.W.

NOTE:
UTILITY CONDUITS PLACED BEFORE STREET CONSTRUCTION. CONDUITS TO BE EXTENDED 5' PAST BACK OF CURB OR BACK EDGE OF SIDEWALK

STANDARD DETAILS
TYPICAL UTILITY LOCATIONS
PUBLIC AND PRIVATE

Revised 1/2019
Standard Plate No. GEN-1
NOTES:

1. HAVE BOX EXTEND AS FAR IN FRONT OF SUPPORT POST AS POSSIBLE (THIS IS TO PREVENT SNOW PLOW DAMAGE).
2. ADDRESS MUST BE ON THE SIDE OF BOX FROM WHICH CARRIER APPROACHES AND LETTERS A MINIMUM OF ONE INCH HIGH (OR ON THE FRONT WHEN BOXES ARE GROUPED).
3. BOX MUST BE LOCATED SO CARRIER CAN SERVE WITHOUT LEAVING THE VEHICLE.
4. FACE OF MAILBOX INSTALLED NO CLOSER THAN BACK OF CURB, NO FURTHER THAN 8" BEHIND BACK OF CURB.
5. ALL POSTS TO BE A MINIMUM OF 18" BEHIND THE BACK OF CURB.
6. DIMENSION PER U.S. POSTAL SERVICE.
NOTES:
1. HAVE BOX EXTEND AS FAR IN FRONT OF SUPPORT POST AS POSSIBLE (THIS IS TO PREVENT SNOW PLOW DAMAGE).
2. ADDRESS MUST BE PLACED ON SIDE OF BOX FROM WHICH THE CARRIER APPROACHES IN LETTERS A MINIMUM OF 1" HIGH (OR ON THE FRONT WHERE BOXES ARE GROUPED).
3. BOX MUST BE LOCATED SO CARRIER CAN SERVE WITHOUT LEAVING THEIR VEHICLE.
4. DIMENSIONS PER U.S. POSTAL SERVICE.
5. INSTALL BREAK AWAY MAILBOX PER MNDOT STANDARD PLATE 9350A.
2X8 CEDAR

41"-45" MIN. HEIGHT

1X6 CEDAR

TOP OF CURB

4X4 CEDAR

GUTTER

FRONT

SECTION

48" BURY

STANDARD DETAILS
MULTIPLE MAILBOX SUPPORT
WOOD STRUCTURE DESIGN

Revised 1/2019
Standard Plate No. GEN-2C
This sign marks the upslope edge of a wetland buffer. The plantings downslope of this sign contain native trees, flowers, shrubs and grasses that provide food and shelter for birds, fish and other native wildlife.

The plants also help to hold soil to prevent erosion and filter nutrients from adjacent lawns to improve the quality of the water entering the wetlands.

1. THE SIGN MUST BE:
   a. 0.063 ALUMINUM BLANK,
   b. BACKGROUND PANTONE: 155 (TAN)
   c. BLACK VERBIAGE AND LOGO PRINTED ONE SIDE
   d. PRE-DRILL HOLES IN MIDDLE TOP AND BOTTOM (AVOID VERBIAGE)
   e. TRIM TO BORDER AS SHOWN ON SIGN ARTWORK TO INSURE ROUNDED CORNERS

2. THE MARKER SHALL CONSIST OF A FOUR INCH SQUARE TREATED, OR CEDAR POST, OR GREEN STEEL POST INSTALLED TO A HEIGHT OF FOUR FEET ABOVE GRADE, AND SET AT LEAST 42" INTO GROUND.

3. BOLT OR SCREW SIGN TO POST.


5. ARTWORK AND VERBIAGE SHALL FACE PROPOSED HOME (STRUCTURE).

6. CONTACT CITY FOR POTENTIAL SIGN SOURCES.
This sign marks the edge of a wetland. Filling, draining, or excavating beyond this point is prohibited without written authorization from the Watershed District.

Per City Ordinance, no disturbance (mowing, grading, filling, or structures) in the wetland or buffer area allowed.

1. THE SIGN MUST BE:
   a. 0.063 ALUMINUM BLANK,
   b. BACKGROUND PANTONE: 155 (TAN)
   c. BLACK VERBIAGE AND LOGO PRINTED ONE SIDE
   d. PRE-DRILL HOLES IN MIDDLE TOP AND BOTTOM (AVOID VERBIAGE)
   e. TRIM TO BORDER AS SHOWN ON SIGN ARTWORK TO INSURE ROUNDED CORNERS

2. THE MARKER SHALL CONSIST OF A FOUR INCH SQUARE TREATED, OR CEDAR POST, OR GREEN STEEL POST INSTALLED TO A HEIGHT OF FOUR FEET ABOVE GRADE, AND SET AT LEAST 42" INTO GROUND.

3. BOLT OR SCREW SIGN TO POST.


5. ARTWORK AND VERBIAGE SHALL FACE PROPOSED HOME (STRUCTURE).

6. CONTACT CITY FOR POTENTIAL SIGN SOURCES.
NOTE:
INSTALL STRUCTURE MARKERS AT ALL
STRUCTURES NOT IN PAVED SURFACES.

NOTE:
ALL POSTS TO BE 2" SQUARE CHANNEL, 8' LONG.
PLACED AS DIRECTED BY
THE CITY ENGINEER.
MATCH ALL CITY SIGN
POST MATERIALS AND
INSTALLATION PRACTICES,
SEE DETAIL PLATE STR-29.
NOTES:

1. STREET LIGHT FIXTURE TO BE MANUFACTURED BY STERNBERG LIGHTING OR APPROVED EQUAL.
2. STREET LIGHT TO BE ARTISAN 1280 LED, 64 WATT/3040 LUMENS OR APPROVED EQUAL.
3. STREET LIGHT POLE TO BE 5" SQUARE, SMOOTH SHAFT, URBAN LINE SQUARE STRAIGHT ALUMINUM POLE SSA, WITH A MILLENA SPLIT BASE MODEL ML900 TO FIT A 5" POLE OR APPROVED EQUAL.
4. LIGHT POLE TO EXTEND 12 TO 15 FEET ABOVE GROUND SURFACE.
NOTES:
1. PEDESTRIAN STREET LIGHT FIXTURE TO BE MANUFACTURED BY STERNBERG LIGHTING OR APPROVED EQUAL.
2. PEDESTRIAN STREET LIGHT TO BE A 730LED, 23 WATT, PRAIRIE LIGHTED BOLLARD OR APPROVED EQUAL.
3. STANDARD OAH: 48" AG.
NOTE:
SIGN POST TO BE A MINIMUM 3 FT BEHIND BACK OF CURB. THE CITY ENGINEER SHALL STAKE THE APPROXIMATE LOCATION FOR SIGN PLACEMENT. THE CONTRACTOR SHALL INSTALL SIGNS IN THESE LOCATION AND IN ACCORDANCE WITH (MMUTCD). IF THERE IS A CONFLICT WITH THE PROPOSED SIGN LOCATION, THE CONTRACTOR SHALL NOTIFY THE CITY ENGINEER IMMEDIATELY.

EXISTING GROUND
INSERT POST 6" INTO ANCHOR

9" STREET I.D.
2" RAIN CAP (TLARC 200)

3/8" DRIVE RIVETS W/ NYLON WASHERS TLXDR (3878 - 05)
FOR LETTERING DETAILS, SEE STANDARD PLATE STR-19

NOTE: NYLON LOCK NUT

POST 2" * 2" * 12'
(20D12 - 12 - QP)

5/16" CORNER BOLT W/ NYLON LOCK NUT (TLCB 516M)

2" ABOVE GROUND

STABILIZER
2 1/2" * 2 1/2" * 18"
(24F12 - ODA - PG)

ANCHOR
2 3/4" * 2 3/4" * 4'
(22F12 - 04 - PG)

SPACER 1/2" X 2" PVC W/ #34 - 2" CHERRY MATE RIVET

FOR LETTERING DETAILS, SEE STANDARD PLATE STR-19

5/16" CORNER BOLT (TLCB 516M)
5/16" NYLON LOCK NUT

CHISAGO CITY
Gateway to the Lakes

STANDARD DETAILS
STREET SIGN INSTALLATION
STREET I.D. SIGNS

Revised
1/2019
Standard Plate No.
GEN-10
NOTE:
1. SIGN POST TO BE A MINIMUM 3 FT BEHIND BACK OF CURB. THE CITY ENGINEER SHALL STAKE THE APPROXIMATE LOCATION FOR SIGN PLACEMENT. THE CONTRACTOR SHALL INSTALL SIGNS IN THESE LOCATION AND IN ACCORDANCE WITH (MMUTCD). IF THERE IS A CONFLICT WITH THE PROPOSED SIGN LOCATION, THE CONTRACTOR SHALL NOTIFY THE CITY ENGINEER IMMEDIATELY.
2. IF 3 STREET ID SIGNS ARE REQUIRED, POST SHALL BE 13 FT IN HEIGHT.

EXISTING GROUND
INSERT POST 6" INTO ANCHOR

2" ABOVE GROUND

STABILIZER
2 2/3" * 2 2/3" * 18"
(24F12 - ODA - PG)

ANCHOR
2 2/3" * 2 3/4" * 4"
(22F12 - 04 - PG)

5/16" CORNER BOLT
W/ NYLON LOCK NUT
(TLCB 516M)

5/16" NYLON LOCK NUT
(TLCB 516M)

SPACER 1/2" X 2" PVC
W/ #34 - 2" CHERRY MATE RIVET

2" RAIN CAP
(TLARC 200)

30" OR 36" STOP SIGN

3/8" DRIVE RIVETS
W/ NYLON WASHERS
TLXDR (3878 - 05)

POST 2" * 2" * 12'
(20D12 - 12 - QP)

9" STREET I.D.

5" CORNER BOLT
W/ NYLON LOCK NUT
(TLCB 516M)
NOTE:
1. SIGN POST TO BE A MINIMUM 3 FT BEHIND BACK OF CURB. THE CITY ENGINEER SHALL STAKE THE APPROXIMATE LOCATION FOR SIGN PLACEMENT. THE CONTRACTOR SHALL INSTALL SIGNS IN THESE LOCATION AND IN ACCORDANCE WITH (MMUTCD), IF THERE IS A CONFLICT WITH THE PROPOSED SIGN LOCATION, THE CONTRACTOR SHALL NOTIFY THE CITY ENGINEER IMMEDIATELY.
NOTE:
1. ALL PAINT COLOR IS TO BE WHITE.
2. USE MNDOT SPECIFICATIONS FOR MUTI-COMP.
3. LAYOUT FOR CROSSWALK SHALL BE APPROVED BY THE CITY ENGINEER PRIOR TO INSTALLATION.
4. POSITION SO SPACES ARE IN WHEEL PATHS.
PRECAST INVERT MUST BE 1/2 DIAMETER OF THE PIPE AND BENCHES SLOPED 2" TOWARD THE INVERT.

MANHOLE STEPS SHALL BE PLACED SO THAT OFFSET VERTICAL PORTION OF CONE IS FACING DOWNSTREAM.

CASTING AND ADJUSTMENT RINGS AS SPECIFIED.

MANHOLE STEPS, NEENAH R1981J OR EQUAL, 16" ON CENTER.

ALL JOINTS IN MANHOLE SHALL CONFORMING TO ASTM 443.

WRAP EACH MANHOLE BARREL JOINT WITH 12" MASTIC SEAL, OR RING JOINTS W/ 3/4" RAM - NEK BITUMINOUS ROPE.

PIPE SHALL BE CUT 2" INSIDE FACE OF WALL AT MID-POINT OF PIPE AND HAVE A WATER TIGHT SEAL. NOTE: KOR-N-SEAL OR PSX DIRECT DRIVE MANHOLE CONNECTOR CONSIDERED ACCEPTABLE ALTERNATES.

ALL DOG HOUSES SHALL BE GROUTED ON INSIDE AND OUTSIDE.

MINIMUM THICKNESS OF INTEGRAL PRECAST BASE IS 6" FOR 14' DEEP OR LESS, AND INCREASES 1" IN THICKNESS FOR EVERY 4' OF DEPTH GREATER THAN 14'.
PRECAST INVERT MUST BE 1/2 DIAMETER OF PIPE AND BENCHES SHOULD BE SLOPED 2" TOWARD INVERT.

MANHOLE STEPS SHALL BE PLACED SO THAT OFFSET VERTICAL PORTION OF CONE IS FACING DOWNSTREAM.

CASTING AND ADJUSTMENT RINGS AS SPECIFIED.

MANHOLE STEPS, NEENAH R1981J OR EQUAL, 16" ON CENTER.

ALL JOINTS IN MANHOLE SHALL CONFORM TO ASTM 443.

WRAP EACH MANHOLE BARREL JOINT WITH 12" MASTIC SEAL, OR RING JOINTS W/ 3/4" RAM - NEK BITUMINOUS ROPE.

PIPE SHALL BE CUT 2" INSIDE FACE OF WALL AT MID-POINT OF PIPE AND HAVE A WATER TIGHT SEAL.

NOTE: KOR-N-SEAL OR PSX DIRECT DRIVE MANHOLE CONNECTOR CONSIDERED ACCEPTABLE ALTERNATES.

ALL DOG HOUSES SHALL BE GROUTED ON INSIDE AND OUTSIDE.

MINIMUM THICKNESS OF INTEGRAL PRECAST BASE IS 6" FOR 14' DEEP OR LESS, AND INCREASES 1" IN THICKNESS FOR EVERY 4' OF DEPTH GREATER THAN 14'.
HORSESHOE DETAILS

20' MIN OR 2X DEPTH OF DROP WHICHEVER IS GREATER SHALL BE DIP
VARIABLES 12" - 16"

*DIP OR C-900

8'-1/4 EPOXY COATED BEND INTEGRAL WITH BASE SECTION

* DIP MUST BE POLYETHYLENE, POLYURETHANE, OR EPOXY LINED

CASTING AND ADJUSTMENT RINGS AS SPECIFIED.

MANHOLE STEPS, NEENAH R1981J OR EQUAL, 16" ON CENTER. MANHOLE STEPS SHALL BE PLACED SO THAT OFFSET VERTICAL PORTION OF CONE IS FACING DOWNSTREAM.

ALL JOINTS IN MANHOLE SHALL CONFORM TO ASTM 443

WRAP EACH MANHOLE BARREL JOINT WITH 12" MASTIC SEAL, OR RING JOINTS W/ 3/4" RAM - NEK BITUMINOUS ROPE.

PIPE SHALL BE CUT 2" INSIDE FACE OF WALL AT MID-POINT OF THE PIPE AND HAVE A WATER TIGHT SEAL.
NOTE: KOR-N-SEAL MANHOLE OR EQUAL CONSIDERED ACCEPTABLE ALTERNATE.

ALL DOG HOUSES SHALL BE GROUTED ON INSIDE AND OUTSIDE.

PRECAST INVERT SHOULD BE 1/2 DIAMETER OF PIPE AND BENCHES SLOPED 2" TOWARD INVERT.

MINIMUM THICKNESS OF INTEGRAL PRECAST BASE IS 6" FOR 14' DEEP OR LESS, AND INCREASES 1" IN THICKNESS FOR EVERY 4' OF DEPTH GREATER THAN 14'.

STANDARD DETAILS
SANITARY SEWER
DROP INLET MANHOLE

CHISAGO CITY
1/2019

Revised
Standard Plate No.
SAN-3
NOTE:
INSIDE DROP SHALL BE
INTRAFLOW LOW PROFILE DROP
AS MANUFACTURED BY ROYAL
ENTERPRISES OR AN APPROVED
EQUAL.

DIRECT PIPE TO FLOW DOWNSTREAM.

FLOW
PHOENIX PLASTIC CASING SPACER
OR APPROVED EQUAL

CASING
CARRIER PIPE

FILL VOID AREA
WITH SAND (TYP)

SANITARY SEWER OR WATER MAIN PIPE SUPPORT
IN CASING, PLASTIC SPACERS
NOT TO SCALE
NOTES:
1. NO SHIMS TO BE USED OTHER THAN MORTAR OR BRICK WHEN ADJUSTING RINGS AND CASTING.

NEENAH R-3067V CATCH BASIN FRAME AND GRATE SHALL BE FURNISHED WITH CURB INLET BOX AND 3" DIA. FRONT FACE AND 4" MAXIMUM OPENING.

CATCH BASIN STRUCTURE WITH TOP SLAB OR 2' X 3' BOX.

INFA-SHIELD SEAL OR APPROVED EQUAL

NEENAH R-1642B MANHOLE FRAME AND COVER SHALL BE FURNISHED WITH 2 CONCEALED PICK HOLES AND STAMPED "SANITARY SEWER" OR "STORM SEWER".

MANHOLE STRUCTURE WITH TOP SLAB OR CONE SECTION.

CONCRETE ADJUSTMENT RINGS. MIN. OF 4", MAX. OF 12". FULL BED OF MORTAR BETWEEN CASTING AND RINGS. (NON-SHRINK GROUT) PLASTER INSIDE AND OUT OF RINGS. NO CONCRETE COLLAR.
PROPOSED SANITARY SEWER

COMPACTED BACKFILL

6" ABOVE THE PIPE

SECTION A-A

HIGH DENSITY POLYETHYLENE RIGID INSULATION PLACEMENT

8'

2 LAYERS OF 2" (MIN.) HIGH DENSITY POLYETHYLENE RIGID INSULATION 4' X 8' SHEETS. SEAMS SHALL BE STAGGERED.

EXTEND 6' BEYOND CURB LINE

FUTURE CURB & GUTTER

BITUMINOUS ROADWAY

GRAVEL BASE

UNDISTURBED SOIL

COMPACTED BACKFILL

PROPOSED SANITARY SEWER
NOTES:
1. HDPE PIPE SHALL BE DUCTILE IRON PIPE SIZES (DIPS).
2. CONTRACTOR SHALL PROVIDE AND INSTALL #12 AWG SOLID (0.0808" DIAMETER) CCS EXTRA HIGH STRENGTH HARD DRAWN HORIZONTAL DRILL TRACER WIRE MANUFACTURED BY COPPERHEAD INDUSTRIES, LLC OR APPROVED EQUAL.
3. TRACER WIRE SHALL HAVE A MINIMUM 45 MIL HDPE, 30 VOLT MINIMUM RATING, AND A 1150 POUND MINIMUM AVERAGE BREAK STRENGTH.
4. TRACER WIRE SHALL BE BLUE FOR WATERMAIN AND GREEN FOR SANITARY SEWER.
5. ATTACH TRACER WIRE TO PIPE IN A MANNER THAT ENSURES IT REMAINS INTACT THOUGHOUT THE ENTIRE INSTALLATION PROCESS.
6. TRACER WIRE TO BE BROUGHT TO SURFACE AT GATE VALVE AND/OR HYDRANT LOCATIONS AND AIR RELEASE MANHOLES.
7. TRACER WIRE BROUGHT TO THE SURFACE SHALL BE MARKED AND IDENTIFIED WITH A TRI-VIEW FLEX TEST STATION CONTAINING TWO INTERNAL TERMINALS MANUFACTURED BY RHINO MARKING AND PROTECTION SYSTEMS OR APPROVED EQUAL. TEST STATION FOR WATER SHALL BE BLUE WITH RHINO PART #TVT172BB2 OR APPROVED EQUAL AND CONTAIN ONE DECAL ON EACH SIDE OF TEST STATION WITH RHINO PART #GD8-1332K OR APPROVED EQUAL. TEST STATIONS FOR SEWER SHALL BE GREEN WITH RHINO PART 3TVT172GB2 OR APPROVED EQUAL AND CONTAIN ONE DECAL ON EACH SIDE OF THE TEST STATION WITH RHINO PART #GD8-1316K OR APPROVED EQUAL.
8. TRANSITION FROM HDPE TO DIP SHALL BE MADE AT THE EXTREMITIES OF HYDRANT CONNECTIONS, WATERMAIN CROSSINGS AND SERVICES.
9. HDPE TO DUCTILE IRON FITTING CONNECTIONS SHALL BE MADE WITH ONE OF THE FOLLOWING, UNLESS APPROVED BY THE CITY ENGINEER:
   - MJ ADAPTORS (FUSED TO HDPE PIPE) APPROVED BY THE CITY
   - MEGALUGS AND STAINLESS STEEL PIPE STIFFENERS SHALL BE MODEL CPS AS MANUFACTURED BY CASCADE WATERWORKS MFG. OR APPROVED EQUAL.
NEENAH R-3067V CATCH BASIN FRAME AND GRATE SHALL BE FURNISHED WITH CURB INLET BOX AND 3" DIA. FRONT FACE AND 4" MAXIMUM OPENING.

HIGH DENSITY POLYETHYLENE (HDPE) ADJUSTMENT RINGS. MIN. OF 4", MAX. OF 8". SET BOTTOM RING IN MORTAR AND GLUE REMAINING RINGS WITH APPROVED SEALANT. NO CONCRETE COLLAR.

CATCH BASIN STRUCTURE WITH TOP SLAB OR 2' X 3' BOX.

NON-WOVEN FILTER FABRIC

NEENAH R-1642B MANHOLE FRAME AND COVER SHALL BE FURNISHED WITH 2 CONCEALED PICK HOLES AND STAMPED "SANITARY SEWER" OR "STORM SEWER".

HIGH DENSITY POLYETHYLENE (HDPE) ADJUSTMENT RINGS. MIN. OF 4", MAX. OF 8". SET BOTTOM RING IN MORTAR AND GLUE REMAINING RINGS WITH APPROVED SEALANT. NO CONCRETE COLLAR.

MANHOLE STRUCTURE WITH TOP SLAB OR CONE SECTION.
NOTE:
1. INSTALL GREEN TRACER WIRE, 12 GA. MINIMUM DIA. ON ALL SANITARY SERVICES. ATTACH SECURELY TO PIPE WITH DUCT TAPE OR EQUAL.
2. INSTALL BLUE TRACER WIRE, 12 GA. MINIMUM DIA. ON ALL WATER SERVICES. ATTACH SECURELY TO PIPE WITH DUCT TAPE OR EQUAL.
SERVICE RISER
4" DIP OR PVC SCH. 40

MINIMUM 4" THICK CONCRETE ENCASEMENT

PAYMENT

SEWER MAIN

STANDARD DETAILS
SERVICE RISER

1/2019

SER-2
NOTE:
1. SERVICE PAY LENGTH = TOTAL LENGTH INSTALLED, INCLUDING RISER. (BENDS AND FITTINGS INCIDENTAL)
2. EXCESSIVE SAN. SEWER MAINLINE DEPTH MUST BE REVIEWED AND APPROVED BY THE CITY ENGINEER.
3. INSTALL TRACER WIRE OF 12GA. MINIMUM DIAMETER ON ALL SANITARY SERVICES. ATTACH TRACER WIRE SECURELY TO PIPE WITH DUCT TAPE OR EQUAL. TAPE EXCESS WIRE ON PVC CAP AT END OF SERVICE.
4. SANITARY SERVICE TO BE BEDDED ON 6" SAND MINIMUM AND 6" OVER THE PIPE.
5. INSTALL WATER SERVICE UPSTREAM OF SANITARY SERVICE.
6. PLACE CURB STOP AT PROPERTY LINE. END COPPER AND SANITARY SERVICE 10' BEYOND PROPERTY LINE.
7. SERVICE RISE OFF MAIN SHALL BE USED TO BRING SANITARY SERVICE TO THE 15' DEPTH.
8. PLUG END OF SANITARY SERVICE.
9. A METAL FENCE POST SHALL BE PLACED AT THE END OF EACH SANITARY SERVICE SO THAT IT IS A MAXIMUM OF 1' BELOW GRADE ON ALL LOTS.
10. TRACER WIRE SHALL BE GROUNDED AT THE END THAT IS BELOW GRADE.
11. TRACER WIRE SHALL BE PLACED IN A VALVCO TSAB TRACER WIREBOX AND PLACED NEXT TO THE CURB STOP.

NOTE:
SERVICE PIPE TO PRESSURE RATED AT 150 PSI (MIN.)
NOTES:
1. CITY WATER SERVICE & PLUMBING PERMITS REQUIRED FOR WORK BY PRIVATE CONTRACTORS.
2. ANNUAL TESTING OF RPZ REQUIRED.
3. REQUIRED EQUIPMENT MUST BE ENCLOSED AND SUPPORTED.
4. SLEEVES FOR PIPES IN CONCRETE SLABS SHALL BE 4" DIAMETER PVC OR SIMILAR.
NOTES:
1. WATER SERVICE SHUTOFF TO BE LOCATED A MINIMUM OF 5' OUTSIDE OF THE DRIVEWAY EDGE, OR A MINIMUM OF 3' INSIDE OF THE DRIVEWAY EDGE.
2. SHUT OFFS LOCATED IN THE DRIVEWAY WILL REQUIRE A NEENAH R-1914-A CASTING WITH A LOCKING COVER OR APPROVED EQUAL.
NOTE:
CORE DRILL HOLE IN RCP FOR TEE BRANCH. SEAL VOID AROUND TEE W/PREFORMED RUBBER GASKET OR NON-SHRINK GROUT.

TEE BRANCH - FOR SIZE AND TYPE SEE SPECIFICATIONS.
TEE NOT TO INTRUDE INTO RCP PIPE

IF SERVICE IS NOT REQUIRED INSTALL A WATERTIGHT PLUG

REINFORCE WITH WATERTIGHT GROUT
NOTE:
1. CLEANOUTS ARE REQUIRED AT 100LF INTERVALS, INCLUDING THE RISER FROM THE MAIN.
2. BRING TRACER WIRE OF 12 GAUGE OR EQUIVALENT TO SURFACE WITH CLEANOUT. FIRMLY ATTACH TRACER WIRE TO PIPE WITH DUCT TAPE MATERIAL OR APPROVED EQUAL.
3. METER BOX AND COVER (FORD A-1 OR APPROVED EQUAL) SHALL BE 6’’ TO 12’’ BELOW SURFACE IN GREEN AREAS AND SHALL BE $\frac{1}{4}''$ TO $\frac{3}{4}''$ BELOW ALL PAVEMENT SURFACES.

INSTALL METER BOX AND COVER (NEENAH R-1914) WITH SANITARY LETTERING OR APPROVED EQUAL OVER ALL PVC CLEANOUTS

AROUND SERVICE WYE, USE MIXED 4’’ CONCRETE ENCASEMENT

PVC SERVICE PIPE

12 GA. TRACER WIRE OR EQUAL

DUCT TAPE OR EQUAL

END OF LINE

PVC LONG RADIUS BEND

INSTALL METER BOX AND COVER (NEENAH R-1914) WITH SANITARY LETTERING OR APPROVED EQUAL OVER ALL PVC CLEANOUTS
NOTE:
1. 6" GRANULAR MATERIAL SHALL BE WELL COMPACTED AND LEVELED TO PERMIT PROPER BEARING FOR THE INSULATION BOARD.
2. INSULATION SHALL BE OF 1" OR 2" THICK BOARDS HIGH DENSITY POLYETHYLENE RIGID INSULATION SPECIFICALLY DESIGNED FOR USE IN UNDERGROUND CONSTRUCTION AND HAVING A MINIMUM COMPRESSIVE STRENGTH OF 35 PSI.
3. THESE BOARDS ARE DIFFERENT THAT THE TYPE USED IN ORDINARY BUILDING CONSTRUCTION. THE INSULATION BOARD SHALL COMPLY WITH ASTM-D 1621.

### REQUIREMENTS FOR WIDTH AND THICKNESS OF HIGH DENSITY POLYETHYLENE RIGID INSULATION PLACED 6" ABOVE TOP OF PIPE FOR VARIOUS PIPE DEPTHS.

<table>
<thead>
<tr>
<th>&quot;D&quot;</th>
<th>&quot;W&quot;</th>
<th>&quot;T&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>DEPTH TO TOP OF PIPE</td>
<td>COMPUTER WIDTH OF INSULATION REQUIRED</td>
<td>THICKNESS OF INSULATION REQUIRED</td>
</tr>
<tr>
<td>2 FT. TO 3 FT.</td>
<td>d + 15 FT. = _________</td>
<td>4 IN.</td>
</tr>
<tr>
<td>3 FT. TO 4 FT.</td>
<td>d + 13 FT. = _________</td>
<td>3 IN.</td>
</tr>
<tr>
<td>4 FT. TO 5 FT.</td>
<td>d + 11 FT. = _________</td>
<td>3 IN.</td>
</tr>
<tr>
<td>5 FT. TO 6 FT.</td>
<td>d + 6 FT. = _________</td>
<td>2 IN.</td>
</tr>
<tr>
<td>6 FT. TO 7 FT.</td>
<td>d + 4 FT. = _________</td>
<td>2 IN.</td>
</tr>
<tr>
<td>7 FT. (ASSUMED FROST LINE)</td>
<td></td>
<td>0 IN.</td>
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</tbody>
</table>
NOTE:
1. WATER SERVICE TAPPING SADDLE FOR DIP SHALL BE A FORD F1 OR APPROVED EQUAL. CITY ENGINEER SHALL PRE-APPROVE ALL TAPPING SADDLES PRIOR TO INSTALLATION.
2. THE CITY ENGINEER MUST APPROVE ALL SADDLE INSTALLATIONS. SADDLES MAY ONLY BE USED ON ¾" TO 2" SERVICES. ANY LARGER SERVICES MUST BE CUT-INS OR WET TAPPED TO WATERMAIN.
3. TAPPING SADDLES SHALL BE USED ON ALL SERVICE TAPS INTO WATERMAIN 4 INCHES IN DIAMETER OR SMALLER AND FOR ALL TAPS LAGER THAN 1", UNLESS APPROVED BY THE CITY ENGINEER.
NOTE:
1. THE CITY ENGINEER MUST APPROVE ALL SADDLE INSTALLATIONS. SADDLES MAY ONLY BE USED ON $\frac{3}{4}$" TO 2" SERVICES. ANY LARGER SERVICES MUST BE CUT-INS OR WET TAPPED TO WATERMAIN.
2. ONE OF THE FOLLOWING SADDLES SHALL BE USED FOR TAPPING INTO HDPE WATERMAIN UNLESS APPROVED BY THE CITY ENGINEER:

   A. SIDE FUSING TAPPING SADDLE AS MANUFACTURED BY POLY-CAM, INC. OR APPROVED EQUAL.

   B. ELECTROFUSION CORP, SADDLE AS MANUFACTURED BY CENTRAL PLASTICS COMPANY OR APPROVED EQUAL.

SIDE FUSING TAPPING SADDLE AS MANUFACTURED BY POLY-CAM, INC. OR APPROVED EQUAL.

ELECTROFUSION CORP. SADDLE AS MANUFACTURED BY CENTRAL PLASTICS COMPANY OR APPROVED EQUAL.
NOTE:
ALL WATER SERVICES SHALL BE DISCONNECTED AT THE WATERMAIN. TURN CORPORATION STOP OFF AND ENCASE IN CONCRETE. REMOVE 10 FEET OF SERVICE LINE FROM THE MAIN.
NOTE:
1. IF WATER SERVICE IS LESS THAN 5' DEEP, RELAY THE WATER SERVICE AS DIRECTED BY THE CITY ENGINEER.
2. INSULATION SEAMS SHALL BE STAGGERED IF MORE THAN ONE LAYER IS INSTALLED.

STORM SEWER CROSSING

2 LAYERS (MIN) OF 2" INSULATION 4' X 8' HIGH DENSITY POLYETHYLENE RIGID INSULATION SHEETS UNDERNEATH THE WATER SERVICE, CENTERED OVER THE STORM SEWER PIPE. WIDTH OF INSULATION TO BE 4 TIMES THE DIAMETER OF STORM PIPE OR AS DIRECTED BY THE CITY ENGINEER.
NEENAH R-1914 OR APPROVED EQUAL
NOTE:
1. TRACER WIRE ACCESS BOX SHALL BE OF DOMESTIC MANUFACTURE AND BE EQUAL TO VALVCO TWAB. TSAB FOR SANITARY SEWER.
2. TRACER WIRE SHALL BE TERMINATED AT EACH END IN FLUSH MOUNT ACCESS BOX.
3. ACCESS BOX SHALL HAVE A CAST IRON LID THAT CAN BE LOCKED AND OPENED WITH A STANDARD PENTAGON HEAD KEY WRENCH.
4. TRACER WIRES SHALL BE STRIPPED AND ATTACHED TO STAINLESS STEEL SCREWS MOUNTED TO THE Underside OF THE LID. SUFFICIENT SLACK SHALL BE LEFT IN WIRE LENGTH SO COVER CAN BE LIFTED WITH WIRE INTACT.
5. TRACER WIRE ACCESS BOX SHALL BE LOCATED DIRECTLY IN FRONT OF FIRE HYDRANTS, CURB STOPS OR WHERE INDICATED ON DRAWINGS AND BE SET TO GRADE.
PRECAST INVERT SHOULD BE 1/2 DIAMETER OF PIPE AND BENCHES SLOPED 2" TOWARD INVERT.

MANHOLE STEPS SHALL BE PLACED SO THAT OFFSET HOLE IN TOP SLAB IS FACING DOWNSTREAM.

CASTING AND ADJUSTMENT RINGS AS SPECIFIED.

PRECAST REINFORCED CONCRETE MANHOLE AND SLAB SHALL CONFORM TO ASTM C478 AND C497

TOP OF BARREL SECTION BELOW TOP SLAB TO HAVE FLAT TOP EDGE SEALED WITH 2 BEADS OF RAMNEK OR EQUAL.

MANHOLE STEPS, NEENAH R1981J OR EQUAL, 16" ON CENTER.

ALL JOINTS IN MANHOLE SHALL CONFORM TO ASTM 443

DOGHOUSES MUST BE GROUTED BOTH INSIDE AND OUTSIDE.

PIPE SHALL BE CUT 2" INSIDE OF FACE OF WALL AT MID-POINT OF PIPE.

BASE SLAB SHALL CONFORM TO ASTM C478 AND C497

NO BLOCK STRUCTURES OR PRECAST INVERTS ARE ALLOWED.

PLAN

SECTION

STANDARD DETAILS
STORM SEWER JUNCTION MANHOLE W/ REINFORCED TOP SLAB

Revised 1/2019
Standard Plate No. STO-1
PRECAST INVERT SHOULD BE 1/2 DIAMETER OF PIPE AND BENCHES SLOPED 2" TOWARD INVERT.

MANHOLE STEPS SHALL BE PLACED SO THAT OFFSET HOLE IN TOP SLAB IS FACING DOWNSTREAM.

CASTING AND ADJUSTMENT RINGS AS SPECIFIED.

PRECAST REINFORCED CONCRETE MANHOLE AND SLAB SHALL CONFORM TO ASTM C478 AND C497

NO BLOCK STRUCTURES OR PRECAST INVERTS ARE ALLOWED.

TOP OF BARREL SECTION BELOW TOP SLAB TO HAVE FLAT TOP EDGE SEALED WITH 2 BEADS OF RAMNEK OR EQUAL.

MANHOLE STEPS, NEENAH R1981J OR EQUAL, 16" ON CENTER.

ALL JOINTS IN MANHOLE SHALL CONFORM TO ASTM 443

DOGHOUSES MUST BE GROUTED BOTH INSIDE AND OUTSIDE.

PIPE SHALL BE CUT 2" INSIDE OF FACE OF WALL AT MID-POINT OF PIPE.

BASE SLAB SHALL CONFORM TO ASTM C478 AND C497
**STANDARD DETAILS**

**TYPE II**

**CATCH BASIN MANHOLE**

Revised: 1/2019  
Standard Plate No.: STO-3

---

**PLAN**

- **24"X36" SLAB OPENING FOR NEENAH R3067V OR ESS. BROS. 330 HIGH CAPACITY OR EQUAL. INSTALL R3501-TB FOR DRIVEWAYS AND R3290-A FOR VALLEY GUTTERS. (VANE GRATE SHOWN)**

- **DIMENSION FROM BACK OF CURB TO CENTER OF PIPE.**
  - 4' DIA. MH - 9" IN FROM BACK OF CURB
  - 5' DIA. MH - 3" IN FROM BACK OF CURB
  - 6' DIA. MH - 3" BEHIND BACK OF CURB
  - 7' DIA. MH - 9" BEHIND BACK OF CURB
  - 8' DIA. MH - 15" BEHIND BACK OF CURB

**SECTION**

- **CASTING AND ADJUSTMENT RINGS AS SPECIFIED.**
- **PRECAST REINFORCED CONCRETE MANHOLE AND SLAB SHALL CONFORM TO ASTM C478 AND C497**
- **TOP OF BARREL SECTION BELOW TOP SLAB TO HAVE FLAT TOP EDGE SEALED WITH 2 BEADS OF RAMNEK OR EQUAL.**
- **ALL JOINTS IN MANHOLE CONFORM TO ASTM 443.**
- **NO BLOCK STRUCTURES OR PRECAST INVERTS ARE ALLOWED.**
- **MANHOLE STEPS, NEENAH R1981J OR EQUAL, 16" ON CENTER. PLACED BELOW THE DOWNSTREAM CORNER OF THE OPENING NEAREST THE STREET.**
- **DOGHouses MUST BE GROUTED BOTH INSIDE AND OUTSIDE.**
- **BASE SLAB SHALL CONFORM TO ASTM C478 AND C497**
24"x36" SLAB OPENING FOR CASTING AS SPECIFIED.

DIMENSION FROM BACK OF CURB TO CENTER OF PIPE.
4' DIA. MH - 9" IN FROM BACK OF CURB
5' DIA. MH - 3" IN FROM BACK OF CURB
6' DIA. MH - 3" BEHIND BACK OF CURB
7' DIA. MH - 9" BEHIND BACK OF CURB
8' DIA. MH - 15" BEHIND BACK OF CURB

CASTING AND ADJUSTMENT RINGS AS SPECIFIED.

PRECAST REINFORCED CONCRETE MANHOLE AND SLAB SHALL CONFORM TO ASTM C478 AND C497

TOP OF BARREL SECTION BELOW TOP SLAB TO HAVE FLAT TOP EDGE SEALED WITH 2 BEADS OF RAMNEK OR EQUAL.

ALL JOINTS IN MANHOLE SHALL CONFORM TO ASTM 443.

NO BLOCK STRUCTURES OR PRECAST INVERTS ARE ALLOWED.

MANHOLE STEPS, NEENAH R1981J OR EQUAL, 16" ON CENTER.

DOGHOUSES MUST BE GROUTED BOTH INSIDE AND OUTSIDE.

BASE SLAB SHALL CONFORM TO ASTM C478 AND C497

NO DRAIN HOLES
NOTE: VANE GRATE SHOWN

DIRECTION OF FLOW

NOTE: VANE GRATE SHOWN

CASTING AND ADJUSTMENT RINGS AS SPECIFIED.

MIN. 4" AND MAX. 12" IN HEIGHT FOR CONCRETE ADJUSTMENT RINGS. FULL BED OF MORTAR BETWEEN CASTING AND RINGS. (NO-SHRINKING GROUT REQUIRED) 1" MAX. MORTAR THICKNESS WHEN USED FOR CASTING ADJUSTMENT. SEE DETAIL SHEET STO-13

GROUTED INVERT

DOGHOUSES SHALL BE GROUTED ON BOTH THE INSIDE AND OUTSIDE.

PLAN

GRATE TO BE 2" BELOW GUTTER GRADE. 10' TRANSITION EACH SIDE OF CATCH BASIN.

SECTION

NO DRAIN HOLES

24" X 36" PRECAST

4' MAX

VARI

1'-0"

5"

3"

6"

6"

3'-0"

2'-0"

6"

6"
Casting and adjustment rings as specified.

Grate to be 2" below gutter grade. 10' transition each side of catch basin.

Doghouses shall be grouted on both the inside and outside.

No drain holes

Plan

Section

24" x 36" precast

4" max varies

4" 3" grout

6"

3" 6" 6"
SEE CITY PLATE NO. STO-8 FOR RIPRAPH PLACEMENT.

ANCHOR CLIP

24" MAX

6"

ANCHOR BOTH SIDES.

TIE LAST 3 PIPE JOINTS. USE 2 TIE BOLT FASTENERS PER JOINT. INSTALL AT 60° FROM TOP OR BOTTOM OF PIPE.

PROVIDE 3 ANCHOR CLIPS TO FASTEN TRASH GUARD TO FLARED END SECTION. HOT DIP GALVANIZE AFTER FABRICATION.

ISOMETRIC

*TRASH GUARD SIZING

<table>
<thead>
<tr>
<th>PIPE SIZE</th>
<th>BARS</th>
<th>'H'</th>
<th>BOLTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>24&quot;-42&quot;</td>
<td>1&quot;Ø</td>
<td>6&quot;</td>
<td>3/4&quot;</td>
</tr>
<tr>
<td>48&quot;-72&quot;</td>
<td>1 1/4&quot;Ø</td>
<td>12&quot;</td>
<td>1&quot;</td>
</tr>
</tbody>
</table>

*PROVIDE TRASH GUARDS ON FLARED ENDS 24" AND GREATER

STANDARD DETAILS

FLARED END SECTION

Revised 1/2019

Standard Plate No. STO-7
RIPRAP REQUIREMENTS

<table>
<thead>
<tr>
<th>D</th>
<th>CY</th>
<th>CLASS</th>
</tr>
</thead>
<tbody>
<tr>
<td>12&quot; TO 24&quot;</td>
<td>8 TO 12</td>
<td>CL.3</td>
</tr>
<tr>
<td>27&quot; TO 33&quot;</td>
<td>14 TO 20</td>
<td>CL.3</td>
</tr>
<tr>
<td>36&quot; TO 48&quot;</td>
<td>23 TO 38</td>
<td>CL.3</td>
</tr>
<tr>
<td>54&quot; AND UP</td>
<td>62 AND UP</td>
<td>CL.4</td>
</tr>
</tbody>
</table>

(ONE CUBIC YARD IS APPROXIMATELY 2,800 LBS.)

EXTEND FABRIC AND RIPRAP UNDER FLARED END SECTION

SECTION A-A
GEOTEXTILE FILTER FABRIC TYPE IV OR V

SECTION B-B
GEOTEXTILE FILTER FABRIC TYPE IV OR V

PLAN

STANDARD DETAILS
RIP RAP AT OUTLETS

Revised: 1/2019
Standard Plate No.: STO-8
4" PERFORATED HDPE WITH GEOTEXTILE WRAP MIRAFI 140s FILTER SOCK OR EQUAL.

SELECT GRANULAR

1' (TYP.)

CURB AS SPECIFIED

AGGREGATE BASE

GEOTEXTILE FABRIC, TYPE V, NON-WOVEN

TRENCH DETAIL

1/4" 0/HOLE (HYP.)

4" PERFORATED HDPE WITH GEOTEXTILE WRAP MIRAFI 140s FILTER SOCK OR EQUAL.

PIPE DETAIL

STANDARD DETAILS

4" HDPE PERFORATED DRAINTILE WITH FILTER ROCK

1/2019

STO-9
BEEHIVE CASTING AS SPECIFIED

40" DIA. x 5" THICK PRECAST REINFORCED CONCRETE BASE SLAB.

PRECAST CONCRETE STRUCTURE. PIPE NOT ALLOWED.

DOGHOUSE SHALL BE GROUTED ON BOTH THE INSIDE AND OUTSIDE.

REINFORCED CONCRETE PIPE

6"-12"
Hole for xx" Dia. outlet pipe.

Baffle wall constructed in field by contractor.

xx" Dia. hole in baffle wall

Simmer opening

1 1/4"

2" x 8" keyway cast into wall by supplier.

Hot-dipped galvanized grate in 2 sections.

Provide 6 1/2" SS anchor bolts w/ clips.

1 1/2" x 3/8" outer ring

1 1/2" x 3/8" steel bars @ 4" O.C.

Elev. = xxx.x

Hole for xx" RCP

Elev. = xxx.x

1/4" x 1/4" steel bar, weld to each member.

Elev. = xxx.x

Elev. = xxx.x

Elev. = xxx.x

6" CLEARANCE

5' Dia. (Typ.) Manhole

6" aggregate backfill (MnDOT Spec. 3149H Mod.)

6" CLEARANCE

ANOTE:
When baffle wall height is greater than 3' above NWL the following shall be required:
1. Steps
2. 6' Diameter MH

Hole for xx" Dia. outlet pipe.

8" Min. slab thickness

When feasible, set invert for outlet pipe below NWL to improve pipe cover and minimize slope around skimmer.

STANDARD DETAILS
POND OUTLET
SKIMMER STRUCTURE

STO-11

1/2019
NOTE: DESIGNER TO ACCOUNT FOR OVERTURNING FORCES IN DESIGN

PROPERTY/OUTLOT LINE AT HWL

MAINTENANCE BENCH

SKIMMER

OUTLET PIPE

SAFETY/AQUATIC VEGETATION BENCH

TYPICAL SIDE SLOPE PROFILE

SIDE SLOPE PROFILE WITHIN 10' OF SKIMMER

TYPICAL BENCH DETAIL

WITHIN 10' OF SKIMMER OUTLET

PROPERTY/OUTLOT LINE AT HWL

MAINTENANCE BENCH

SAFETY/AQUATIC VEGETATION BENCH

TYPICAL BENCH DETAIL
NOTES:
1. THE CATCH BASIN CASTING SHALL LINE UP WITH THE CONCRETE STRUCTURE SO IT CAN BE PROPERLY MAINTAINED.
2. NO SHIMS TO BE USED OTHER THAT MORTAR OR BRICK WHEN ADJUSTING RINGS OR CASTINGS.
3. PLACE NO. 4 REBAR (TO EXTEND 10' BEYOND EACH SIDE OF THE CASTING) EMBEDDED IN CONCRETE COLLAR AND CURB.
CATCH BASIN AT P.C. OR P.T.

B618 CURB & GUTTER

RADIUS VARIES

CATCH BASIN IN RADIUS

B618 CURB & GUTTER

RADIUS VARIES

DOUBLE CATCH BASIN

B618 CURB & GUTTER

RADIUS VARIES

MNDOT B618 CONC. C & G

SURMOUNTABLE C & G

SECTION A-A

STANDARD DETAILS
CONCRETE CURB AND GUTTER CONSTRUCTION AT CATCH BASINS

Revised
1/2019
STR-2
NOTE:
SURMOUNTABLE CURB & GUTTER TO BE FORMED INTO A B618 TYPE AT CATCH BASIN.

CATCHBASIN FRAME & COVER NEENAH R-3067 OR EQUAL WITH VANE GRATE.

NOTES:
CATCHBASIN TO BE DEPRESSED 2" BELOW DESIGN GUTTER LINE GRADE.

SURMOUNTABLE CONCRETE CURB & GUTTER
- 2 - #4 REBARS EACH WAY

DESIGN GUTTER LINE GRADE

SECTION A-A

FRAME & CASTING
1. Panel width shall not exceed 10 feet without a contraction joint.
2. Driveway to be one course concrete pavement.
3. 7” thickness for residential, 8” thickness for commercial, and alley or as specified.
4. Driveway width is 24’ with a 36’ maximum unless otherwise noted.
5. Minimum distance from lot line is 5’.
6. Neenah R-1914-A casting or approved equal is required for curb stops located in driveways.
7. Max. cross slope of sidewalk through driveway is 0.02 ft/ft. Adjust apron running slope as needed.
NOTE:
B STYLE C & G TO ONLY BE USED UNDER EXISTING CONDITIONS OR AT CATCH BASINS.

RESIDENTIAL ADT 300-1000

RESIDENTIAL ADT UNDER 300
NOTE:
1. LOCATE HYDRANT AT LOT LINE ON THE BULB SIDE OF THE CUL-DE-SAC.
2. B STYLE C&G TO BE USED UNDER EXISTING CONDITIONS OR AT CATCH BASINS.
1. DETECTABLE WARNING SURFACE SHALL BE CAST IRON UNPAINTED PER MNDOT STANDARDS. USE RADIAL CURB LINES. WARNING SURFACES SHOULD BE PLACED AT THE BACK OF CURB WHEN THE WARNING SURFACE AND CURB ARE NOT PARALLEL. IN THIS CASE, HAND FORM THE CURB TO FILL THE GAP.

2. MAX. SLOPE 0.02 FT/FT ALL DIRECTIONS FOR LANDING.

3. MAX CROSS SLOPE 0.02 FT/FT FOR RAMP.

SECTION A-A

- 1/4" MAX. VERTICAL LIP AT FLOW LINE
- CONCRETE CURB & GUTTER MATCH TOP OF CURB FOR SURMOUNTABLE CURB

SECTION B-B

- TOP OF CURB
- 4'-0" MIN. MATCH WALK WIDTH
- VARIABLE
- VARIABLE
- VARIABLE
- VARIABLE

PLAN

- BACK OF CURB
- CURB RADIUS (SEE PLAN) 2'-0"
- VARIABLE 4'-0" MIN. MATCH WALK WIDTH
- VARIABLE
- A
- B
- MATCH WALK WIDTH
- VARIABLE
- MAX. SLOPE 0.02 FT/FT FOR RAMP.
- ROUND ALL SLOPED INTERSECTIONS
- MAX. SLOPE 0.10' FT/FT.

STANDARD DETAILS

PEDESTRIAN CURB RAMP

Revised: 1/2019
Standard Plate No.: STR-7
NOTE:
TEMPORARY TURN-A-ROUND SHALL NOT BE INSTALLED WITH CONCRETE CURB AND GUTTER.
TURN-A-ROUND SHALL CONTAIN EITHER BITUMINOUS CURB OR NO CURB.

OPTION #1 (CUL-DE-SAC)

OPTION #2 (HAMMER HANDLE)
NOTE:
1. CONTROL JOINTS IN CONCRETE CURB NOT TO EXCEED 10' SPACING THROUGH DRIVEWAY SECTION.
2. ALL DRIVEWAYS MUST BE AT LEAST 5 FEET FROM THE PROPERTY LINE AND AT LEAST 30 FEET FROM A STREET RIGHT OF WAY.
3. ONLY ONE DRIVEWAY ENTRANCE PER PARCEL UNLESS OTHERWISE APPROVED BY CITY.
4. NEENAH R-1914-A CASTING IS REQUIRED FOR CURB STOPS LOCATED IN DRIVEWAYS.
5. MAX. CROSS SLOPE OF SIDEWALK THROUGH DRIVEWAY IS 0.02 FT/FT. ADJUST APRON RUNNING SLOPE AS NEEDED.
MEASUREMENT FOR PAYMENT

METHOD OF PAYMENT BY SQUARE YARD

INTEGRAL CAST
EXPANSION JOINT

SECTION A-A THRU
B618 C & G

SECTION B-B
THRU CONCRETE GUTTER

STANDARD DETAILS
CONCRETE VALLEY GUTTER
NOTES:
1. THE BARRICADE BOARD FACE SURFACES SHALL BE FULLY REFLECTORIZED IN ALTERNATE SILVER-WHITE AND RED STRIPING, USING A REFLECTIVE SHEETING CONFORMING TO THE REQUIREMENTS OF SPEC 3352.2A2b, STANDARD NO. 2.

2. THE PLACEMENT OF THE BARRICADE SHALL BE 10'-0" FROM THE END OF THE BITUMINOUS ROAD WITH THE BARRICADE CENTERED ON THE ROADWAY FACING THE FLOW OF TRAFFIC.

3. THE BARRICADE SHALL BE HAVE REFLECTORIZED SHEETING APPLIED BEFORE BEING INSTALLED ON THE POSTS.

4. PLACE "FUTURE THRU STREET" SIGNAGE ON BARRICADE, IF DIRECTED BY THE CITY ENGINEER.
NOTE:
COUNTERSINKING, CLEANING AND SEALING OF RANDOM, TRANSVERSE AND LONGITUDINAL CRACKS IN BITUMINOUS PAVEMENTS.

ROAD SURFACE

COUNTERSINK

CRACK ( < \( \frac{1}{2} \)"

= SEALANT

\( \frac{3}{4} \)" MAX \( \frac{1}{8} \"

\( \frac{3}{4} \) + OR - \( \frac{1}{16} \"

\( \frac{3}{4} \)"
STANDARD CONSTRUCTION NOTES FOR STREET ID SIGNS

1. ALL STREET SIGNS SHALL BE V.I.P. (VISUAL IMPACT PERFORMANCE) REFLECTIVE SHEETING PER 3M COMPANY - DIAMOND GRADE VIP REFLECTIVE SHEETING - SERIES 3390 OR APPROVED EQUAL.

2. STREET ID SIGNS SHALL BE 9" IN HEIGHT WITH 1 ¾ CORNER RADIUS, LONGITUDINALLY PUNCHED WITH TWO ¼ HOLES. CENTER HOLES ON THE ID SIGN 1" FROM THE BOTTOM AND 1" FROM THE TOP TO THE CENTER HOLE. IN ADDITION, PLACE TWO ¾ HOLES ½ FROM EACH END AND CENTER IN THE 9" BLANK.

3. STREET NAMES SHALL HAVE 6" UPPER AND LOWER CASE LETTERS. STREET SUFFIX AND ADDRESS SHALL BE 3" IN HEIGHT. FIRST LETTER OF THE SUFFIX SHALL BE UPPER CASE AND WITH ALL REMAINING LETTERS TO BE LOWER CASE.

4. FONT SHALL BE CLEARVIEW ONE FONT VC 35 (ULTRA CONDENSED 35 MPH).

5. STREET ID SHEETING SHALL BE SINGLE FACED WITH 3M DIAMOND GRADE VIP REFLECTIVE SHEETING SERIES 3390 OR AN APPROVED EQUAL. SHEETING WILL BE GREEN IN COLOR AND WHITE LETTERS AND NUMBERS. SIGNS SHALL HAVE A 3/8" WHITE BORDER.

6. SIGN LENGTH SHALL BE SIZED TO FIT THE LETTERING. SIGNS SHALL ALL BE A MINIMUM OF 24" AND A MAXIMUM OR 48".

7. ADDRESS NUMBERS FOR STREET ID SIGNS SHALL BE PROVIDED BY THE CITY'S ENGINEER OR PUBLIC WORKS DEPARTMENT.

8. CONTRACTOR SHALL SUBMIT TO THE CITY/ENGINEER SHOP DRAWINGS FOR STREET ID SIGNS FOR APPROVAL PRIOR TO FABRICATION AND/OR INSTALLATION.


10. LOGO SHALL BE PLACED IN THE LEFT 7" OF THE SIGN, CENTERED.

11. ALL STREET IDENTIFICATION SIGNS SHALL CONSIST OF TWO SIGN BLANKS.

STANDARD STREET ABBREVIATIONS FOR STREET I.D. SIGNS

<table>
<thead>
<tr>
<th>STREET</th>
<th>ROAD</th>
<th>PLACE</th>
<th>ALCOVE</th>
<th>CIRCLE</th>
<th>COURT</th>
<th>TRAIL</th>
<th>POINT</th>
<th>PATH</th>
<th>RUN</th>
<th>LANE</th>
<th>BOULEVARD</th>
</tr>
</thead>
<tbody>
<tr>
<td>St</td>
<td>Rd</td>
<td>Pl</td>
<td>Alc</td>
<td>Cir</td>
<td>Ct</td>
<td>Tr</td>
<td>Pt</td>
<td>Pa</td>
<td>Rn</td>
<td>Ln</td>
<td>Blvd</td>
</tr>
</tbody>
</table>
NOTES:
1. DRIVEWAY WIDTH (W): 12' MIN., 36' MAX.
2. RADIUS AT CONNECTION TO STREET (R): 5' MIN., 15' MAX.
3. CULVERT UNDER DRIVEWAY: MIN. 15" DIA., CMP OR RCP
4. DRIVEWAY SLOPES GREATER THAN 6% SHALL BE PAVED TO PREVENT EROSION.
5. MAINTAIN 60' MIN. CLEARANCE FROM EDGE OF DRIVEWAY TO R/W LINE OF ADJACENT STREET INTERSECTION.
6. CULVERT FLARED ENDS ARE REQUIRED.
7. MINIMUM 1% GRADE ON CULVERTS.
8. HOMEOWNER IS RESPONSIBLE FOR CULVERT INSTALLATION AND ESTABLISHMENT OF VEGETATION ALONG DRIVEWAY.
NOTE: 14' MINIMUM WIDTH FOR ALL STREETS UNDER 300 ADT.
16' MINIMUM WIDTH FOR ALL OTHER STREETS.

3" BITUMINOUS WEAR COURSE-SPWEA230B.
6" CLASS 5 - 100% CRUSHED ROCK BASE, MEETING MNDOT CLASS 5 GRADATION. (ADDITIONAL MATERIAL MAY BE REQUIRED AS DETERMINED AND SPECIFIED BY CITY ENGINEER)

COMPACTED SUBGRADE

VARIES W/TRAIL OR SIDEWALK
30' MIN. W/O TRAIL OR SIDEWALK

14' OR 16' MINIMUM (SEE ABOVE NOTE)
2' SHOULDER
8' MIN. DITCH AREA
8' TRAIL

0.03'/FT. (3%)
(3%)
2:1 MAX.
3:1 MAX.

1.5" SP 9.5 BITUMINOUS WEAR COURSE SPWEA330C
TACK COAT BETWEEN ALL BITUMINOUS LAYERS
2.5" SP 12.5 BITUMINOUS WEAR COURSE SPWEB330C
10" CLASS 5 AGGREGATE BASE
24" SELECT GRANULAR MATERIAL
COMPACT SUBGRADE TO 100% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY

NOTE: STREET SECTIONS VARY DUE TO DESIGN AND A.D.T. COUNTS

4" CONCRETE SIDEWALK (6" CROSSING RES. DRWYS) - (MIX TYPE 3F52A)
(8" CROSSING COM. DRWYS) - (MIX TYPE 3F52A)
10" CLASS 5 - 100% CRUSHED ROCK BASE, MEETING MNDOT CLASS 5 GRADATION. (ADDITIONAL MATERIAL MAY BE REQUIRED AS DIRECTED BY CITY ENGINEER)

COMPACTED SUBGRADE

RIGHT-OF-WAY

SIDEWALK TO BE PLACED ON BOTH SIDES OF THE STREET.

NOTE: SEE MNDOT AND PROJECT SPECIFICATIONS FOR MIX DESIGN INFORMATION

STANDARD DETAILS
TYPICAL SECTIONS
STREETS, TRAILS AND WALKS
RURAL AREA

Revised 1/2019
Standard Plate No. STR-15
NOTE:
14' MINIMUM WIDTH FOR ALL STREETS UNDER 300 ADT.
16' MINIMUM WIDTH FOR ALL OTHER STREETS.

3" BITUMINOUS WEAR COURSE-MIX SPWEA230B
6" CLASS 5 - 100% CRUSHED ROCK BASE, MEETING MNDOT CLASS 5
GRADATION. (ADDITIONAL MATERIAL MAY BE REQUIRED AS
DETERMINED AND SPECIFIED BY CITY ENGINEER)

COMPACTED SUBGRADE

VARIES W/TRAIL OR SIDEWALK
25' MIN. W/O TRAIL OR SIDEWALK

CENTERLINE

14' OR 16'
MINIMUM
(SEE ABOVE NOTE)

0.03'/FT. (3%)

1' TYP.

0.04'/FT. (4%)

0.02'/FT. (2%)

MIN. 4" CLASS 5 UNDER CURB

4" DRAINTILE (SEE
STANDARD PLATE STR-25)

CENTRELINE

CONCRETE CURB & GUTTER
MIX TYPE 3F32 (TYP.)
TACK FACE OF GUTTER PRIOR
TO EACH LIFT OF BIT (TYP.)

0.03'/FT. (3%)

MIN. 4" CLASS 5 UNDER CURB

4" DRAINTILE (SEE
STANDARD PLATE STR-25)

0.04'/FT. (4%)

0.02'/FT. (2%)

1' TYP. ON
SIDEWALKS
AND TRAILS

SIDEWALK TO BE
PLACED ON BOTH SIDES
OF THE STREET.

NOTE: SEE MNDOT AND
PROJECT SPECIFICATIONS
FOR MIX DESIGN
INFORMATION

STANDARD DETAILS
TYPICAL SECTIONS
STREETS, TRAILS AND WALKS

Revised 1/2019
Standard Plate No. STR-16
NOTE:
1. NO DRIVEWAYS TO CONNECT TO ENDS OF EITHER LEG.
2. ALL TURNAROUNDS SHALL BE TO THE LEFT, AS SHOWN.
TYPICAL TRAIL SECTION

FINISHED TRAIL TO BE 1" ABOVE FINISHED SOD

3" BITUMINOUS WEAR - SPWEA230B
6" CL. 5 AGGREGATE BASE

0.02'/FT (MAX.)

CONCRETE SIDEWALK

FINISHED WALK TO BE 1" ABOVE FINISHED SOD

6" CONCRETE - 3F52A
6" CL. 5 AGGREGATE BASE

0.02'/FT (MAX.)

NOTE:
INSIDE EDGE OF WALK TO BE 0.4 FEET ABOVE TOP OF CURB. OUTSIDE EDGE TO BE 0.52 FEET ABOVE TOP OF CURB.
NOTES:
1. ALL ORGANIC OR OTHER UNSUITABLE MATERIAL SHALL BE REMOVED FROM BENEATH THE ROADWAY.
2. A TEST ROLL OF THE PREPARED SUBGRADE SHALL BE PERFORMED IN THE PRESENCE OF A CITY INSPECTOR. THE CITY HAS THE AUTHORITY TO REQUIRE ADDITIONAL SUBGRADE CORRECTION AND GRANULAR BORROW, OR ELIMINATE THE STABILIZATION FABRIC AND GRANULAR BORROW.
3. DRAINTILE IS REQUIRED BEHIND CURB, MINIMUM 50' EACH WAY FROM CATCH BASINS.
SIGN PANELS AS SPECIFIED OR AS SHOWN ON THE PLANS OR SIGN LEGEND.

2" INCH SQUARE TELESPAR SIGN POST, 12 FEET LONG FOR STREET SIGNS

STREET SIGNS
1. BREAK OFF TO BE SET AT FINISH GRADE.

2. ANCHOR SLEEVE TO BE SET WITH TWO BOLT HOLES EXPOSED AND ACCESSIBLE ABOVE FINISH GRADE.

3. SEE STREET SIGN DETAIL SHEET STR-13 FOR STREET SIGN INSTALLATION.

2 INCH RAIN CAP, (TLARC 200)

3/8" DRIVE RIVETS W/ NYLON WASHERS TLXDR (3878-05)

NOTES:
1. SIGN POST TO BE A MINIMUM OF 3 FT BEHIND BACK OF CURB. THE CITY ENGINEER SHALL STAKE THE APPROXIMATE LOCATION FOR SIGN PLACEMENT. THE CONTRACTOR SHALL INSTALL SIGNS IN THESE LOCATIONS AND IN ACCORDANCE WITH (MMUTCD). IF THERE IS A CONFLICT WITH THE PROPOSED LOCATION, THE CONTRACTOR SHALL NOTIFY THE CITY ENGINEER IMMEDIATELY.

5 16" CORNER BOLT W/ NYLON LOCK NUT (TLCB 516M)

OPTIONAL
2-1/2 INCH SQUARE, 18 INCH LONG OMNI SLEEVE

TELESPAR ANCHOR ASSEMBLY
2 1/4 INCH SQUARE, 4 FEET LONG, 12 GA

CHISAGO CITY
TYPICAL TRAFFIC SIGN INSTALLATION BOULEVARD

STANDARD DETAILS

 Revised 1/2019
 Standard Plate No. STR-22
Plate No. WAT-1

STANDARD DETAILS
INSULATED WATERMAIN

TYPICAL INSTALLATION

- COMPACTED BACKFILL
- MINIMUM 2 LAYERS OF HIGH DENSITY POLYETHYLENE RIGID INSULATION 8' WIDE BY 4" THICK, 6" ABOVE WATERMAIN
- WATERMAIN
- HIGH DENSITY POLYETHYLENE RIGID INSULATION
- BITUMINOUS SURFACE OR GRASSY SURFACE
- 5'-7' TO TOP OF PIPE
- UNDISTURBED SOIL
- EXISTING WATERMAIN

TYPICAL SECTION

NOTE:
SEAMS SHALL BE STAGGERED IF MORE THAN ONE LAYER IS INSTALLED.

Revised 1/2019

CHISAGO CITY
Gateway to the Lakes
BUTTERFLY VALVE AND BOX TYPICAL INSTALLATION

NOTES:

- NO INSIDE ADJUSTMENT SECTIONS ALLOWED.
- VALVE AND BOX SHALL BE STRAIGHT, ALLOWING A 4" PVC PIPE TO SLIDE DOWN THE BOX AND OVER THE GATE OPERATING NUT.
- OPERATING ROD EXTENSION SHALL BE INSTALLED ON ALL VALVES DEEPER THAN 9'.
- MARK ALL VALVE WITH STEEL POST AND GATE VALVE SIGN AND LOCATE 2.0' TO THE SIDE THAT TRAFFIC IS APPROACHING. (OFF STREET AREAS ONLY) SIGN TO FACE TRAFFIC. SEE STANDARD PLATE GEN-S.
- OPERATING ROD EXTENSION SHALL BE TERMINATED AT A OF 5 FEET BELOW STREET GRADE.
- VALVE BOXES SHALL NOT BE LOCATED IN CURB AND GUTTER OR WITHIN 12" AWAY FROM LIP OF CURB AND GUTTER.
- FITTINGS SHALL BE FUSION EPOXY COATED. NUTS AND BOLTS SHALL BE COR-BLUE OR APPROVED EQUAL.
- PROVIDE CONDUCTIVITY STRAP (TYP.) MINIMUM 1/8" X 3/8" WIDE FLAT COPPER STRAP.

0.5 CY 1 1/2" WASHED ROCK

END VIEW

WATER

POWERSEAL VALVE BOX DROP LID OR MUELLER COVER NO. H-10361 OR APPROVED EQUAL LABELED 'WATER'

WATER DROP LID

FINISHED GRADE

7.5 MIN. COVER

BUTTERFLY VALVE BOX DUCTILE IRON POWERSEAL MODEL NO. 8860 OR APPROVED EQUAL

BUTTERFLY VALVES 15" OR LARGER, DRESSER 450, OR PRATT GROUNDHOG OR KENNEDY OR APPROVED EQUAL

BUTTERFLY ADAPTOR AS MANUFACTURED BY ADAPTOR INC. OR APPROVED EQUAL

0.5 CY 1 1/2" WASHED ROCK

8" CONCRETE BLOCK

EXTENSION PIECES

EXTENSION LENGTHS:
- NO. 58- 14"
- NO. 59- 18"
- NO. 60- 24"

TOP SECTION

BOTTOM SECTION

STANDARD DETAILS

BUTTERFLY VALVE AND BOX TYPICAL INSTALLATION

Revised 1/2019

Standard Plate No. WAT-2
GATE VALVE AND BOX TYPICAL INSTALLATION

STANDARD DETAILS

GATE VALVE ADAPTOR:
- 3/8" STEEL WITH PROTECTIVE COATING
- 3/8" RUBBER GASKET INSTALLED BETWEEN GATE VALVE AND ADAPTOR

POWERSEAL VALVE BOX DROP LID OR MUELLER COVER NO. H-10361 OR APPROVED EQUAL LABELED 'WATER'

WATER DROP LID

FINISHED GRADE

ADJUST TOP TO 3/8" TO 1/2" BELOW FINISHED BLACKTOP GRADE OR 1" BELOW FINISHED BOULEVARD GRADE, AND SHALL BE SET SO AS TO PROVIDE 12" OF UPWARD ADJUSTMENT

GATE VALVE BOX DUCTILE IRON POWERSEAL MODEL NO. 8860 OR APPROVED EQUAL

GV ADAPTOR AS MANUFACTURED BY ADAPTOR INC. OR APPROVED EQUAL

PROVIDE CONDUCTIVITY STRAP (TYP) MINIMUM 1/16" X 3/4" WIDE FLAT COPPER STRAP

ALL GATE VALVES SHALL BE OF THE RESILIENT WEDGE TYPE CONFORMING TO AWWA C509-80 STANDARDS

NOTES:
- NO INSIDE ADJUSTMENT SECTIONS ALLOWED.
- VALVE AN BOX SHALL BE STRAIGHT, ALLOWING A 4" PVC PIPE TO SLIDE DOWN THE BOX AND OVER THE GATE OPERATING NUT.
- OPERATING ROD EXTENSION SHALL BE INSTALLED ON ALL VALVES DEEPER THAN 9'.
- MARK ALL VALVE WITH STEEL POST AND GATE VALVE SIGN AND LOCATE 2.0' TO THE SIDE THAT TRAFFIC IS APPROACHING. (OFF STREET AREAS ONLY) SIGN TO FACE TRAFFIC. SEE STANDARD PLATE GEN-5.
- OPERATING ROD EXTENSION SHALL BE TERMINATED AT A OF 5 FEET BELOW STREET GRADE.
- VALVE BOXES SHALL NOT BE LOCATED IN CURB AND GUTTER OR WITHIN 12" AWAY FROM LIP OF CURB AND GUTTER.
- FITTINGS SHALL BE FUSION EPOXY COATED. NUTS AND BOLTS SHALL BE COR-BLUE OR APPROVED EQUAL.

0.5 CY 1 1/2" WASHED ROCK

8" CONCRETE BLOCK

CHISAGO CITY

STANDARD PLATE No. WAT-3

GATE VALVE AND BOX TYPICAL INSTALLATION

Revised 1/2019
NOTES:
1. SHAPE OF BACK OF BUTTRESS MAY VERY AS LONG AS POURED AGAINST FIRM UNDISTURBED EARTH.
2. DIMENSION C1,C2,C3 SHOULD BE LARGE ENOUGH TO MAKE ANGLE $\theta$ EQUAL TO OR LARGER THAN 45°.
3. DIMENSION A1,A2,A3 SHOULD BE AS LARGE AS POSSIBLE WITHOUT INTERFERING WITH MJ BOLTS.
4. $\theta = 45°$ MINIMUM.
5. PLACE POLYETHYLENE BETWEEN CONCRETE & PIPE.

**BUTTRESS DIMENSIONS**

<table>
<thead>
<tr>
<th>PIPE SIZE</th>
<th>22 1/2° BEND</th>
<th>45° BEND</th>
<th>90° BEND</th>
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<tr>
<td></td>
<td>$B_1$</td>
<td>$D_1$</td>
<td>$B_2$</td>
</tr>
<tr>
<td>6&quot;</td>
<td>1'-5&quot;</td>
<td>1'-5&quot;</td>
<td>1'-5&quot;</td>
</tr>
<tr>
<td>8&quot;</td>
<td>1'-5&quot;</td>
<td>1'-5&quot;</td>
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</tr>
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<td>12&quot;</td>
<td>1'-10&quot;</td>
<td>1'-10&quot;</td>
<td>3'-4&quot;</td>
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<td>3'-0&quot;</td>
<td>2'-0&quot;</td>
<td>3'-10&quot;</td>
</tr>
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<td>2'-8&quot;</td>
<td>5'-6&quot;</td>
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<td>6'-10&quot;</td>
</tr>
<tr>
<td>30&quot;</td>
<td>-</td>
<td>-</td>
<td>9'-3&quot;</td>
</tr>
</tbody>
</table>

- SEE NOTE 4

CONCRETE SHALL BE IN CONTACT WITH THIS QUADRANT OF PIPE

BEDDING MATERIAL UNDISTURBED EARTH CONCRETE

SECTION A-A

CONCRETE THRUST BLOCKING

STANDARD DETAILS

CHISAGO CITY

Revised: 1/2019
Standard Plate No.: WAT-5
NOTES:
1. ANNUAL TESTING OF RPZ REQUIRED.
2. REQUIRED EQUIPMENT MUST BE ENCLOSED AND SUPPORTED.
3. SLEEVES FOR PIPES IN CONCRETE SLABS SHALL BE PVC OR APPROVED EQUAL, AND MINIMUM OF ONE NOMINAL SIZE LARGER IN DIAMETER THAN THE PIPE.
4. SEE STANDARD PLATE _____ FOR CURB STOP AND WINTERIZING CURB STOP DETAIL.
NOTES:
1. ALL HYDRANTS LEADS MUST BE VALVED.
2. HYDRANT TO BE 5'-6' BEHIND BACK OF CURB OR 3' BEHIND BIT. TRAIL.
3. NO HYDRANTS SHALL BE LOCATED BETWEEN P.C. OR P.T. OF INTERSECTION RADII.
4. HYDRANT TO BE WATEROUS W-67-250 PACER W/16' BREAKOFF, #5 NUT, 8' BURY, OPENS LEFT.
5. 2 HYDRANT FLAGS PER FIRE HYDRANT ARE REQUIRED (NO SPLINTER PROOF FIBER GLASS AS PRODUCED BY EZ-PRODUCTS IN HUGO, MN OR APPROVED EQUAL).
6. HYDRANT TO BE TIE TO TEE WITH APPROVED RESTRAINING DEVICES, MEGA LUGS OR AS APPROVED BY THE CITY ENGINEER.
7. INTERNAL INSERT TOP SECTIONS ARE NOT ACCEPTABLE (FOR G.V. BOX).
8. HYDRANTS SHALL BE MARKED WITH APPROVED "OT OF SERVICE" TAGS WHEN INSTALLED.
9. "PUMP AFTER USE" PLATES TO BE INSTALLED WHEN "DRAIN HOLES" IN VALVE SEAT ARE OMITTED IN GROUND WATER SITUATIONS.
10. ALL GATE VALVES SHALL BE IN ROADWAY.
11. 6" GATE VALVES SHALL BE INSTALLED A MINIMUM OF 7' FROM CENTER OF HYDRANT ON ALL HYDRANT LEADS OR AS CLOSE TO HYDRANT TEE AS POSSIBLE.
12. A ONE-PIECE HEAVY DUTY OPERATING VALVE ROD IS REQUIRED ON HYDRANTS THAT ARE EXTENDED 24" OR MORE.
13. WHEN INSTALLING A HYDRANT ROD EXTENSION THE NONBREAKABLE COUPLING SLEEVES GO ON THE BOTTOM AND THE BREAKABLE SLEEVES GO ON THE TOP OF THE EXTENSION ROD. VERIFY "TOP AND BOTTOM" OF BREAKOFF SECTION.
14. THE WB-67-250 PACER REQUIRES THE OIL RESERVOIR BE FILLED WITH FOOD GRADE MINERAL OIL.
15. TOUCH UP HYDRANT PAINT (WITH AFC WATEROUS RED) AFTER TURF ESTABLISHMENT AS DIRECTED.
16. FITTINGS SHALL BE FUSION EPOXY COATED. NUTS AND BOLTS SHALL BE COR-BLUE OR APPROVED EQUAL.
WATEROUS IMPROVED PACER SYLTIE
WB67-250
2-2.5" HOSE CONNECTION
1-4.5" STEAMER CONNECTION
RED (WATEROUS ENAMEL NO. V1814-R)

HYDRANT FLAG AS SPECIFIED
CONNECT TRACER WIRE TO SNAKE PIT MAGNETIZED
TRACER BOX - CONCRETE DRIVEWAY BOX BY
COPPERHEAD INDUSTRIES, OR EQUAL.

1 CUBIC YARD MIN. 1 1/2"
WASHED ROCK.
COVER WITH POLYETHYLENE.

BACKFILL TO BE TAMPED

BREAKOFF FLANGE WITH BREAKABLE
RED COUPLINGS

16"
3'
5'
3.0'

TOP CURB

TOP NUT

METAL CHAINS

CONNECT TRACER WIRE TO MAIN
TRACER WIRE

0.5 CY 1 1/2"
WASHED ROCK

4"X4" VERTICAL BLOCK
4"X4" THRUST BLOCK

PLUG DRAIN HOLE WHERE
GROUND WATER IS PRESENT

8" CONCRETE BLOCK

GATE VALVE AND BOX
WITH EXTENSION ROD
GATE VALVE ADAPTOR
AND 1 1/2" ROCK
(SEE WAT - 4)

TIE ALL JOINTS WITH
MEGALUGS (MIN. 4 REQ.)

TRACER WIRE:
#12 AWG COPPER CLAD STEEL
MINIMUM 30 MIL HDPE INSULATION
MINIMUM BREAK LOAD:
450 LB (OPEN TRENCH)
1,150 LB (DIRECTIONAL DRILL)

NOTES:
1. ALL HYDRANTS LEADS MUST BE VALVED.
2. HYDRANT TO BE 5'-6" BEHIND BACK OF CURB OR 3' BEHIND BIT. TRAIL.
3. NO HYDRANTS SHALL BE LOCATED BETWEEN P.C. OR P.T. OF INTERSECTION RADII.
4. HYDRANT TO BE WATEROUS W-67-250 PACER W/16' BREAKOFF, #5 NUT, 8' BURY, OPENS LEFT.
5. 2 HYDRANT FLAGS PER FIRE HYDRANT ARE REQUIRED (NO SPLINTER PROOF FIBER GLASS AS PRODUCED BY EZ-PRODUCTS IN HUGO, MN OR APPROVED EQUAL).
6. HYDRANT TO BE TIED TO TEE WITH APPROVED Restraining Devices, MEGA LUGS OR AS APPROVED BY THE CITY ENGINEER.
7. INTERNAL INSERT TOP SECTIONS ARE NOT ACCEPTABLE (FOR G.V. BOX).
8. HYDRANTS SHALL BE MARKED WITH APPROVED "OT OF SERVICE" TAGS WHEN INSTALLED.
9. "PUMP AFTER USE" PLATES TO BE INSTALLED WHEN "DRAIN HOLES" IN VALVE SEAT ARE OMITTED IN GROUND WATER SITUATIONS.
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14. THE WB-67-250 PACER REQUIRES THE OIL RESERVOIR BE FILLED WITH FOOD GRADE MINERAL OIL.
15. TOUCH UP HYDRANT PAINT (WITH AFC WATEROUS RED) AFTER TURF ESTABLISHMENT AS DIRECTED.
16. FITTINGS SHALL BE FUSION EPOXY COATED. NUTS AND BOLTS SHALL BE COR-BLUE OR APPROVED EQUAL.

STANDARD DETAILS
HYDRANT AND GATE VALVE
IN PAVEMENT

Revised

Standard Plate No.
1/2019 WAT-8
PHOENIX PLASTIC CASING SPACER
OR Approved Equal

CASING PER SPECIFICATION

CARRIER PIPE

FILL VOID AREA
WITH SAND (TYP)

MAX 2' FROM END OF PIPE
MAX 8' EQUALLY SPACED
MAX 8' EQUALLY SPACED
MAX 2' FROM END OF PIPE

WATER MAIN/FORCE MAIN PIPE SUPPORT
IN CASING, PLASTIC SPACERS

NOT TO SCALE

STANDARD DETAILS
PIPE CASING
TYPICAL INSTALLATION

1/2019 WAT-9
NOTE:
1. ALL FITTINGS SHALL BE FUSION BONDED EPOXY COATED DUCTILE IRON TO MEET OR EXCEED ANSI/AWWA C550 AND C116/A21.16 REQUIREMENTS.

2. MEGALUGS WILL NOT BE ALLOWED ON ANY CIP WATER MAIN.

3. SELECT GRANULAR WILL BE REQUIRED BETWEEN INSULATION, WATER MAIN, AND OBSTRUCTION.

4. ALL BENDS SHALL HAVE MEGALUGS OR TIE RODS WITH BLOCKING IN ACCORDANCE WITH STANDARD PLATE WAT-03.

5. COPPER TRACER WIRER SHALL BE USED ON PVC WATER MAIN.

6. ALL WATER MAIN BOLTS SHALL BE CORE-BLUE OR APPROVED EQUAL.
ONE MAIN METER BILLING GOES TO MANAGEMENT COMPANY INDIVIDUAL METERS MAY BE ADDED FOR EACH UNIT FOR MANAGEMENT BILLING BREAK DOWN.

NOTE: ALL METERS MUST BE LOCATED IN A CENTRAL ROOM AT POINT WHERE WATER SERVICE ENTERS BUILDING. IRRIGATION LINES MUST ALSO HAVE SEPARATE METER IF LINE IS CONNECTED PRIOR TO MAIN.

STANDARD DETAILS
MULTIPLE UNITS USING MAIN WATER METER

1/2019  WAT-11
INDIVIDUAL METERS
PER UNIT AND EACH UNIT IS
BILLED SEPARATELY.

NOTE: ALL METERS MUST BE LOCATED IN A
CENTRAL ROOM AT POINT WHERE
WATER SERVICE ENTERS BUILDING.
IRRIGATION LINES MUST ALSO HAVE
SEPARATE METER IF LINE IS
CONNECTED PRIOR TO MAIN.

CHISAGO CITY
Gateway to the Lakes

STANDARD DETAILS
MULTIPLE UNITS USING
INDIVIDUAL WATER METERS

Revised
1/2019
WAT-12
NOTES:
1. TIEING BACK IS TO BE CONSIDERED INCIDENTAL TO INSTALLATION OF WATERMAIN. NO COMPENSATION WILL BE PAID THEREFORE.
2. TIEING BACK OF THE PLUG IS TO BE DONE IN ADDITION TO NORMAL BLOCKING AGAINST UNDISTURBED SOILS.

RETAINER GLAND (TYP) AS APPROVED BY THE CITY ENGINEERING DEPT.

5/8 DIA. THREADED STEEL COATED ROD (MIN. 2 PER PLUG)
NOTES:
1. FOR ALL HDPE PIPE OR EQUAL, INSTALL A TRACER WIRE OF 12 GA. MINIMUM DIAMETER. APPLIES TO WATERMAIN OR SANITARY FORCEMAIN ONLY.
2. ATTACHE TRACER WIRE SECURELY TO PIPE WITH DUCT TAPE OR EQUAL.
3. TRACER WIRE TO BE BROUGHT TO SURFACE AT GATE VALVE LOCATIONS AND AIR RELEASE MANHOLES.