

VILLAGE OF MUNDELEIN

ENGINEERING DETAILS

APPROVED: APRIL 2005

LAST MODIFIED: AUGUST 2019



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NOTE: Reference Mundelein Subdivision Ordinance Section 19.3, Engineering Design Policies, for additional information.

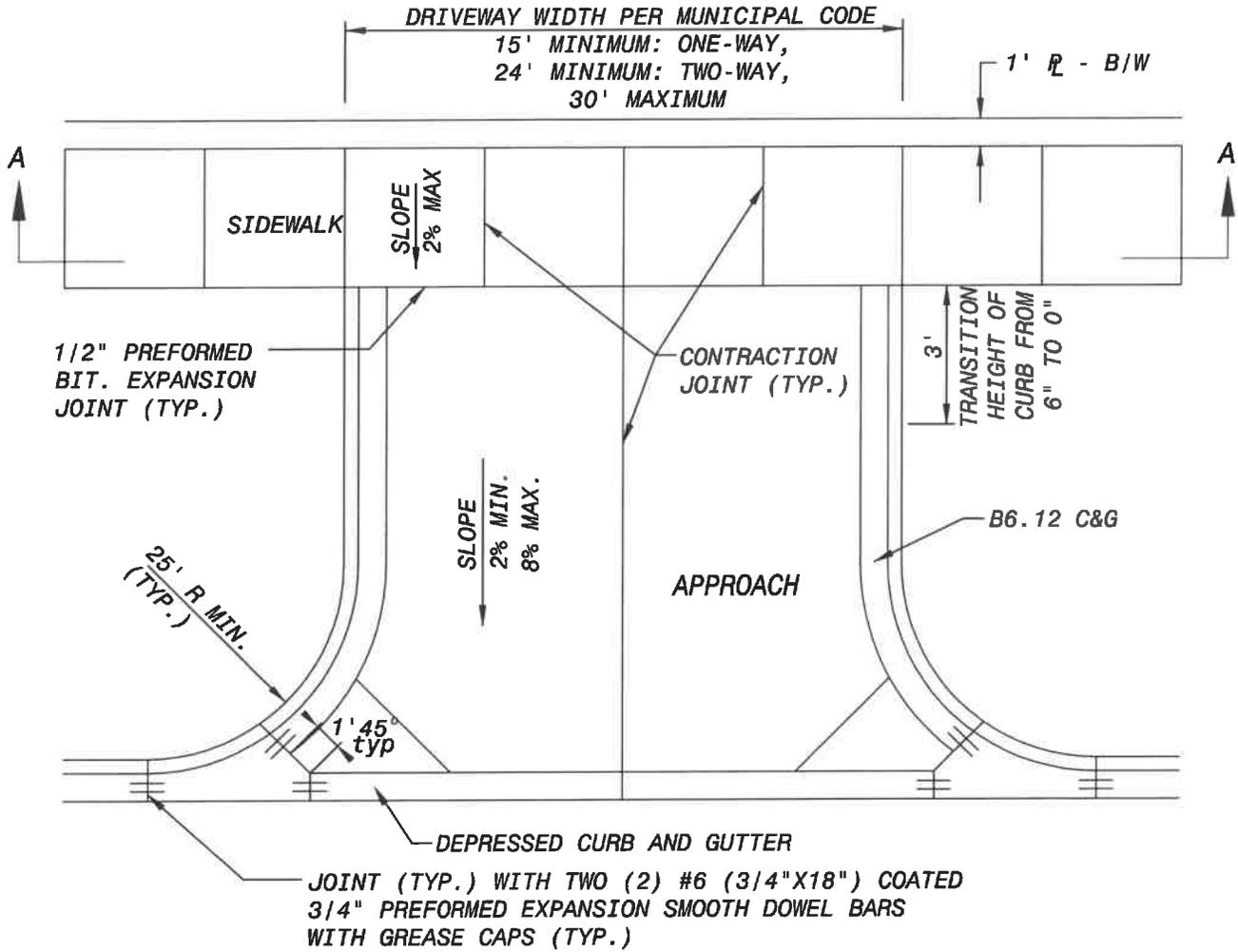
Miscellaneous Roadway Standards/Notes

1. All connecting roadway gradients with an algebraic difference of greater than 1.2 percent shall be connected with a vertical curve. All standards contained in AASHTO's "A Policy on Geometric Design of Highways and Streets," latest edition, regarding vertical curves shall be followed. A design speed of 45 mph shall be used on collector commercial/industrial roads and a design speed of 35 mph shall be used on local streets.
2. Street jogs with centerline offsets of less than 150-feet are not allowed on local roads. Offsets on collector roads are not allowed and spacing between two (2) cross streets on collector roads shall be no closer than 500-feet.
3. Gradients of all streets shall be at least 0.6 percent:
 - a. Collector and industrial streets shall not exceed five (5) percent;
 - b. Local streets shall not exceed eight (8) percent.
4. Any pavement patches located within intersections will require the entire intersection, to radius returns on all the legs, to be milled and resurfaced with two (2)-inch bituminous concrete surface course.
5. Roadway cross-sections showing existing and proposed sections shall be provided at a scale of one (1)-inch = two (2)-feet V, one (1)-inch = ten (10)-feet H for any existing roadway reconstruction and at a scale of one (1)-inch = five (5)-feet V, one (1)-inch = ten (10)-feet H for new roadways.
6. One (1) copy of the Final Engineering Plans must be submitted to the Village in Microstation digital format.
7. All Plats of Subdivision shall be submitted to the Village on a 24-inch x 36-inch Mylar for recording purposes. It shall also be submitted to the Village in electronic format on a CD which can be read by an IBM compatible computer in Microstation format. All coordinates shall be based upon State Plane Coordinates and shall tie to existing monuments as established by the Village of Mundelein. The following specific electronic layers are required: the boundary, roadway centerline, property lines, and roadway right-of-way must each be on a separate layer.
8. A minimum of two (2) permanent concrete bench mark monuments (see Standard Detail R-17) shall be established in all new residential, commercial, and industrial subdivisions. Number of monuments and monument placement shall be approved by the Village Engineer.
9. A qualified geotechnical soils engineer must certify the acceptability of the subgrade of all subdivision streets prior to placing any base course material. This must be based upon the latest addition of the Village of Mundelein's Specifications "Field Quality Control Procedures for Pavement Area Subgrade" (I-1.)

Field Quality Control Procedures For Pavement Area Subgrade

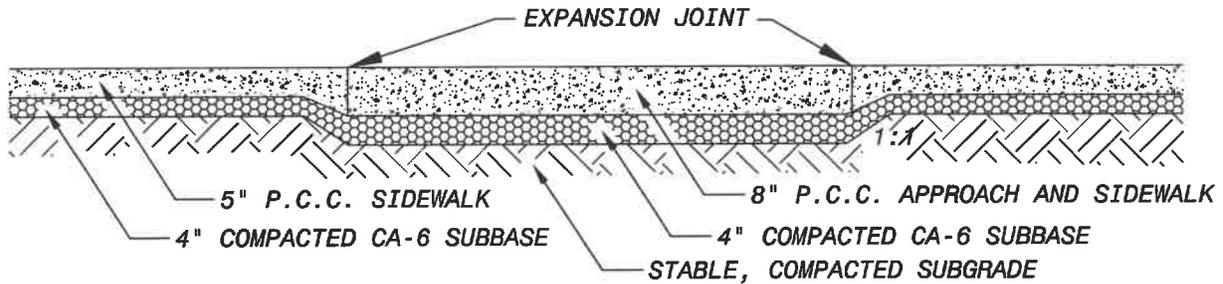
The following procedures are recommended in order to prepare the subgrade for the project.

- A. The work area will first be stripped of vegetation or, in cut areas, excavated to a Design Subgrade Elevation as shown on the plans.
 - 1. The subgrade after cut will be proof rolled to verify a stable subgrade as directed by the soils engineer.
 - 2. A series of test pits may be needed as directed by the soils engineer to verify additional undercut as predicted or estimated by Boring Logs and the Earthwork Undercut Plan.
- Proof rolling procedures will be as follows:
- a. Two (2) to four (4) passes with a 25 ton rubber tire roller or equivalent; and
 - b. Concentrate additional passes in areas that exhibit instability as directed by the soils engineer.
- B. Unstable and unsuitable subgrade materials will be removed to the depth encountered as directed by the Soils Engineer.
 - 1. Materials at undercut subgrade elevation should:
 - a. Have an unconfined compressive strength (Qu) of 2.0 tsf minimum, or cone index of 250 minimum;
 - b. Contain no foreign materials or have organic contents in excess of six (6) percent total organic matter as determined by the Wet Combustion Method (AASHTO T-194); or maximum dry densities less than 105 pcf as determined by AASHTO T-180 (ASTM D-1557); and
 - c. Be able to support necessary construction equipment without severe rutting or deflection.
 - C. At undercut subgrade elevation, the upper eight (8)-inches of soil shall be scarified or disced and recompacted to 95 percent of the maximum dry density as defined by AASHTO T-180 (ASTMD-1557), prior to remedial work fill placement.
 - D. Proof rolling of the prepared undercut subgrade will be done if required by the soils engineer to further verify a stable subgrade prior to fill placement.
 - E. Roadway FILL shall be placed in successive horizontal lifts of not more than six (6)-inches in loose depth (cohesive material), or not more than nine (9)-inches in loose depth (porous granular material.)
 - F. The upper eight (8)-inches of subgrade in areas not undercut shall also be scarified and recompacted to 95 percent of the maximum dry density as defined by AASHTO T-180 (ASTM D-1557), prior to placement of subsequent lift of FILL material.
 - G. Once the existing subgrade is stabilized, FILL can be placed and compacted in lifts to Design Subgrade Elevation. All roadway FILL materials shall be compacted to 95 percent of AASHTO T-180 (ASTM D-1557.)
 - H. When the work listed in the steps above has been completed, the subgrade will be checked by proof rolling and approved by the Village before construction of the subbase, base course, or pavement is started. The Village will make the determination as to whether areas failing this proof roll require additional drying and recompaction or whether the soil conditions warrant more extensive treatment.



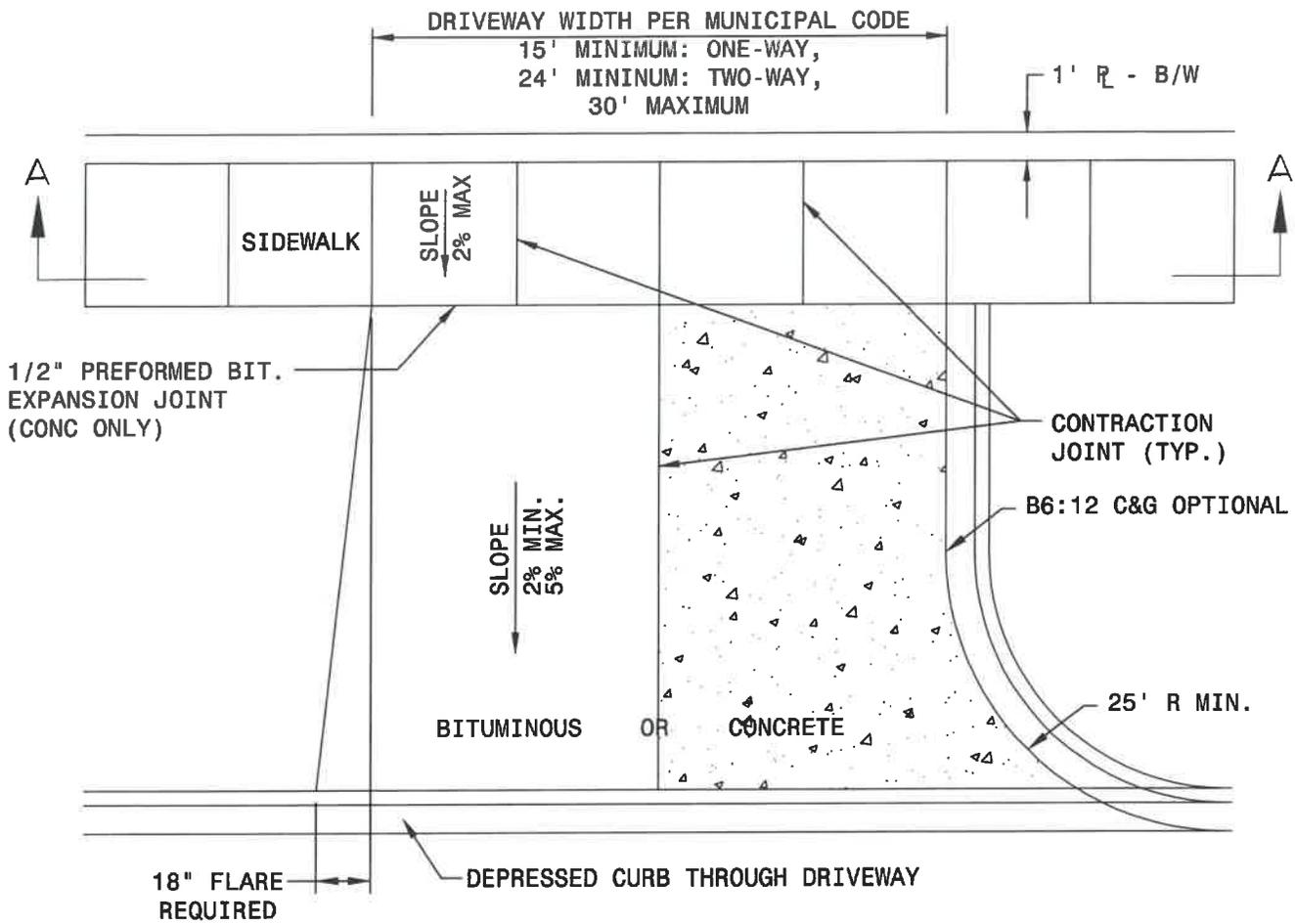
PLAN

NOTE:
ALL AGGREGATE SUBGRADE SHALL BE MECHANICALLY COMPACTED. SAW CUTTING OF TOP OF CURB PROHIBITED



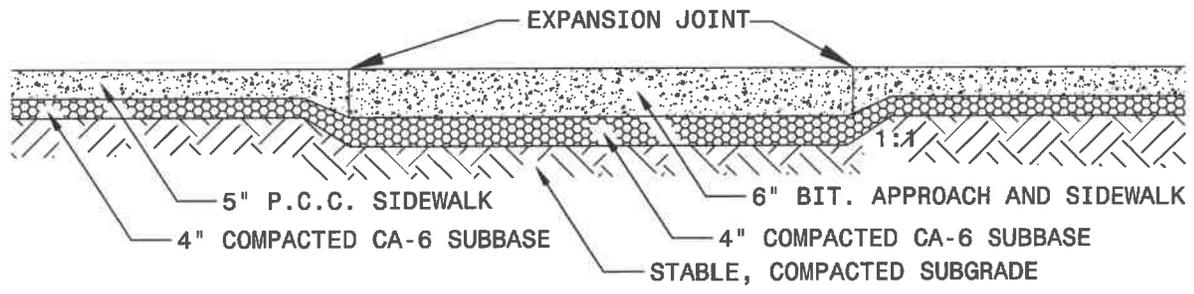
SECTION A-A

REVISIONS				REVISIONS			
REV.	BY	DATE	REVISION	REV.	BY	DATE	REVISION
1.	MDJ	04-04-05	APPROVED	4.			
2.	JRB	01-01-19	APPROVED	5.			
3.				6.			



PLAN

NOTE:
 ALL AGGREGATE SUBGRADE SHALL BE MECHANICALLY COMPACTED. SAW CUTTING OF TOP OF CURB PROHIBITED.



SECTION A-A

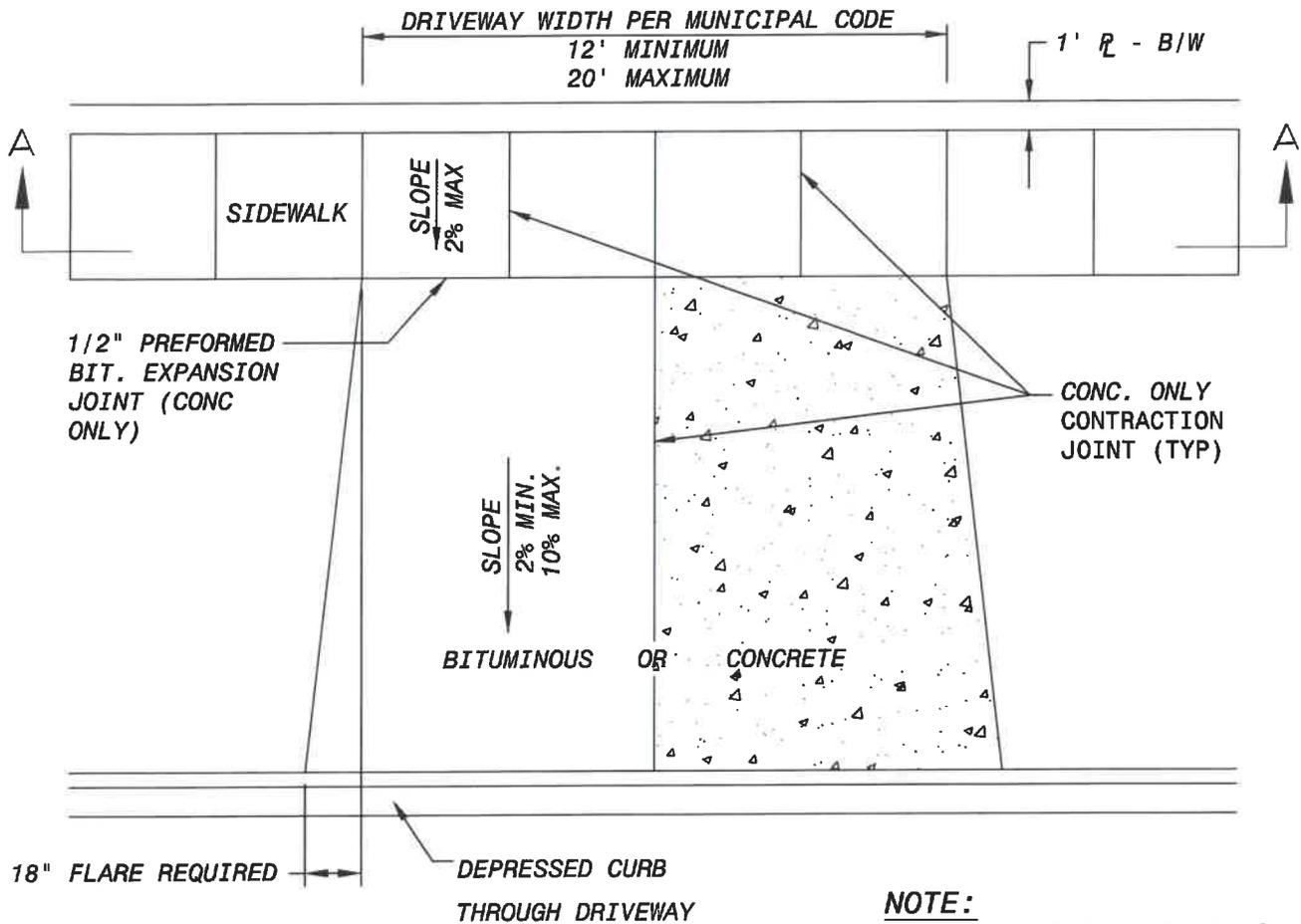


VILLAGE OF MUNDELEIN
 ENGINEERING DETAILS

MULTI-FAMILY RESIDENTIAL
 DRIVEWAY APPROACH

REVISIONS				REVISIONS			
REV.	BY	DATE	REVISION	REV.	BY	DATE	REVISION
1.	MDJ	04-04-05	APPROVED	4.			
2.	JRB	01-01-19	APPROVED	5.			
3.				6.			

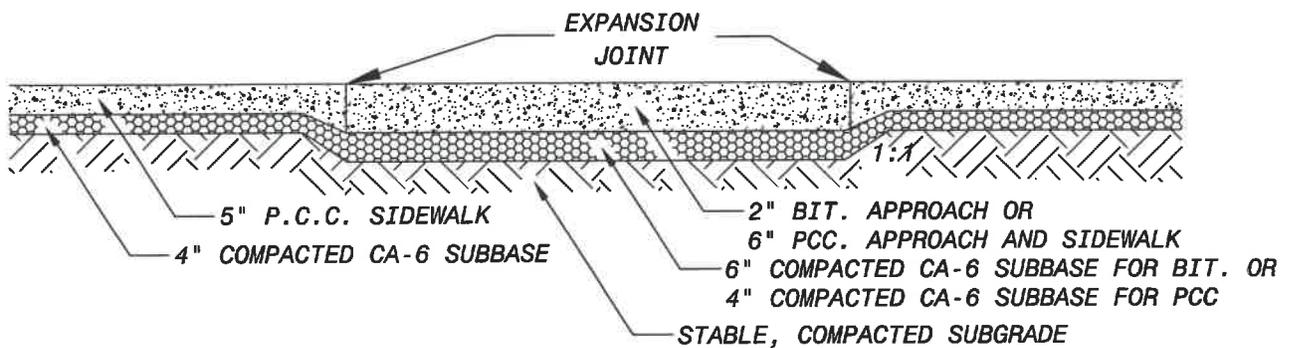
DETAIL NO.
 R-2



PLAN

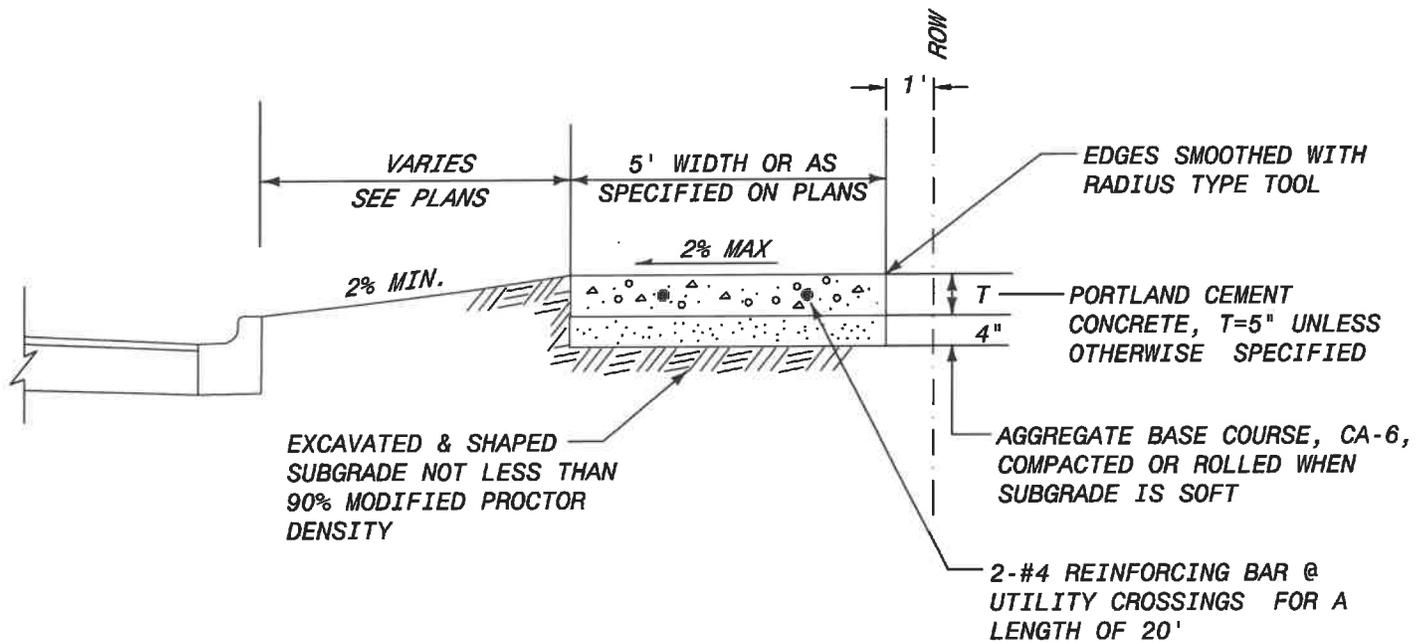
NOTE:

- ALL AGGREGATE SUBGRADE SHALL BE MECHANICALLY COMPACTED.
- SAW CUTTING OF TOP OF CURB PROHIBITED.



SECTION A-A

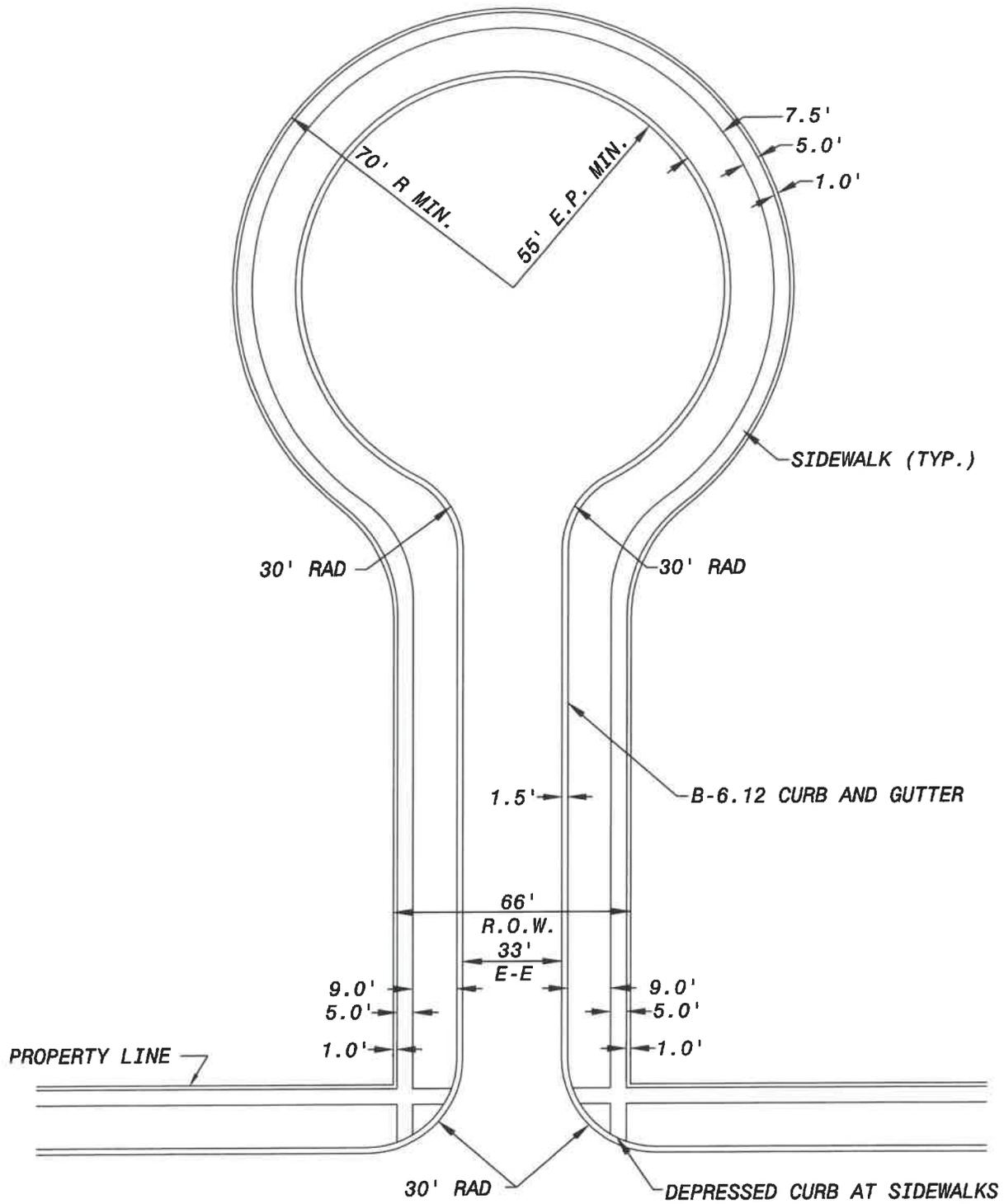
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REV.	BY	DATE	REVISION	REV.	BY	DATE	REVISION
1.	MDJ	04-04-05	APPROVED	4.			
2.	JRB	01-01-19	APPROVED	5.			
3.				6.			



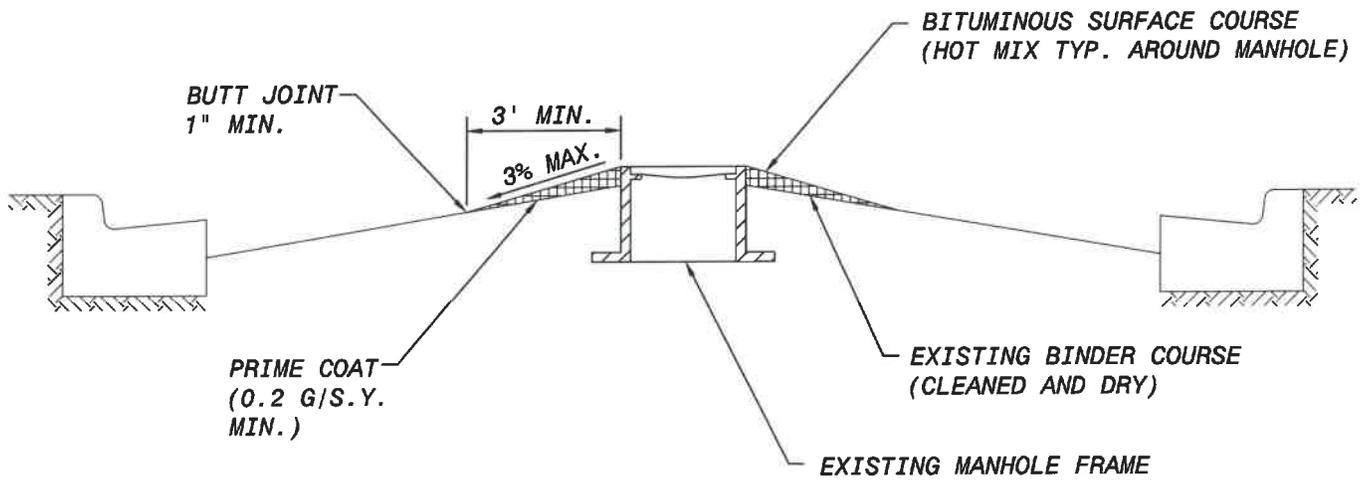
NOTES:

1. LIGHT BROOMED SURFACE FINISH
2. SIDEWALK WIDTH TO BE 5' CONCRETE (UNLESS OTHERWISE APPROVED TO MATCH EXISTING)
3. EXPANSION JOINTS EVERY 100' WITH PREFORMED BITUMINOUS JOINT FILLER
4. TOOLED CONTRACTION JOINT, ONE FOURTH THE DEPTH OF THE SIDEWALK EVERY 5 FEET

REVISIONS				REVISIONS			
REV.	BY	DATE	REVISION	REV.	BY	DATE	REVISION
1.	MDJ	04-04-05	APPROVED	4.			
2.	JRB	01-01-19	APPROVED	5.			
3.				6.			



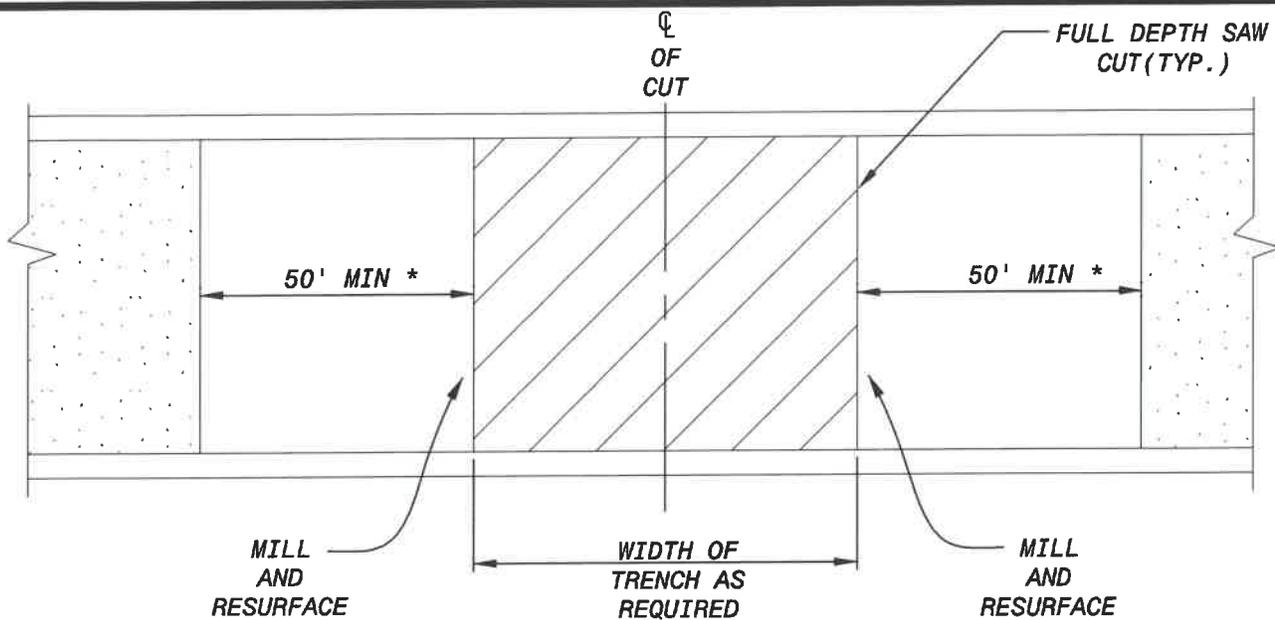
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REV.	BY	DATE	REVISION:	REV.	BY	DATE	REVISION:
1.	MDJ	04-04-05	APPROVED	4.			
2.	JRB	01-01-19	APPROVED	5.			
3.				6.			



NOTES:

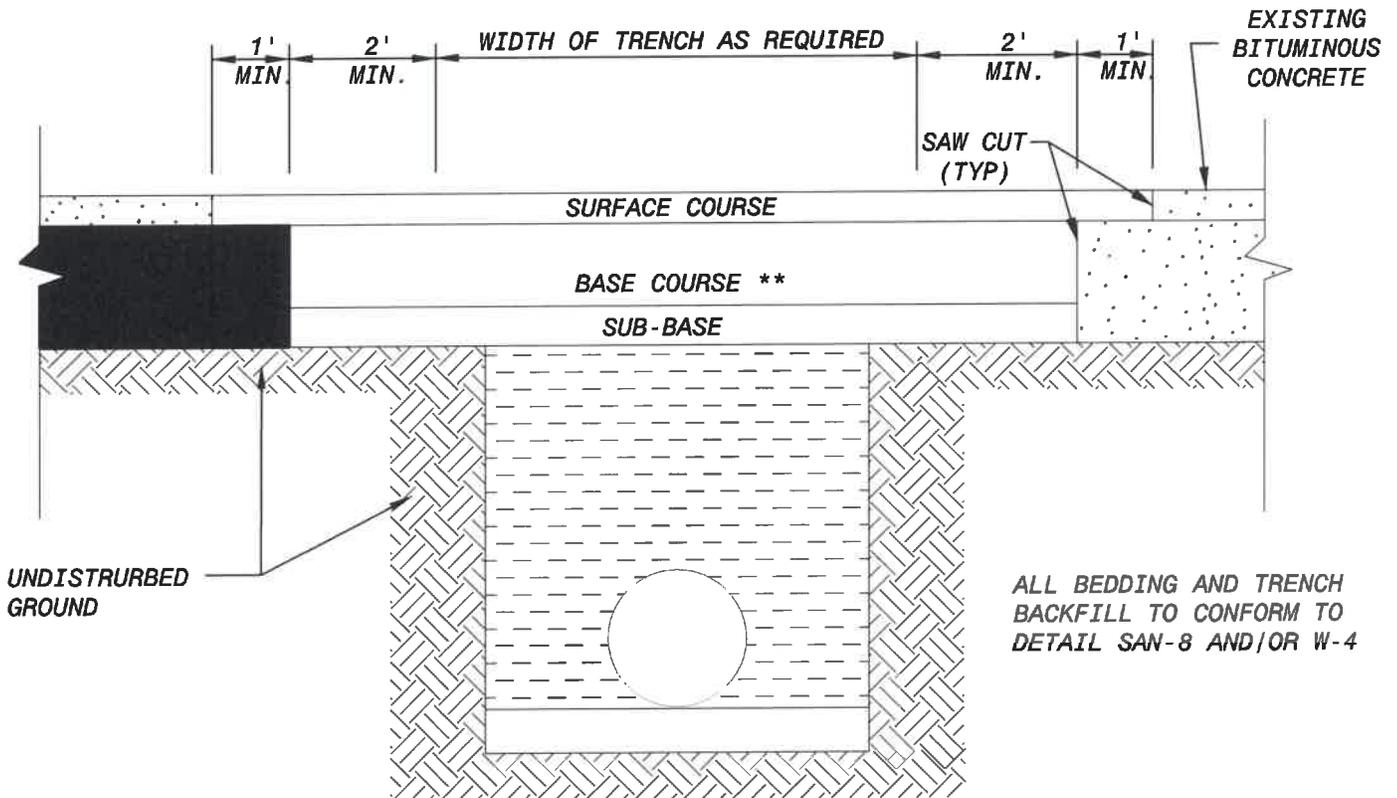
1. RAMP TO BE MAINTAINED THROUGHOUT THE WINTER AND UNTIL FINAL SURFACE IS IN PLACE.
2. RAMP MATERIAL TO BE REMOVED BY MILLING OR OTHERWISE REMOVED BEFORE PLACEMENT OF FINAL SURFACE COURSE.

REVISIONS				REVISIONS			
REV.	BY	DATE	REVISION	REV.	BY	DATE	REVISION
1.	MDJ	04-04-05	APPROVED	4.			
2.	JRB	01-01-19	APPROVED	5.			
3.				6.			



*OR AS DIRECTED BY VILLAGE REPRESENTATIVE

PLAN VIEW



CROSS SECTION VIEW

** BASE COURSE THICKNESSES SHALL BE IN ACCORDANCE WITH DETAIL R-9



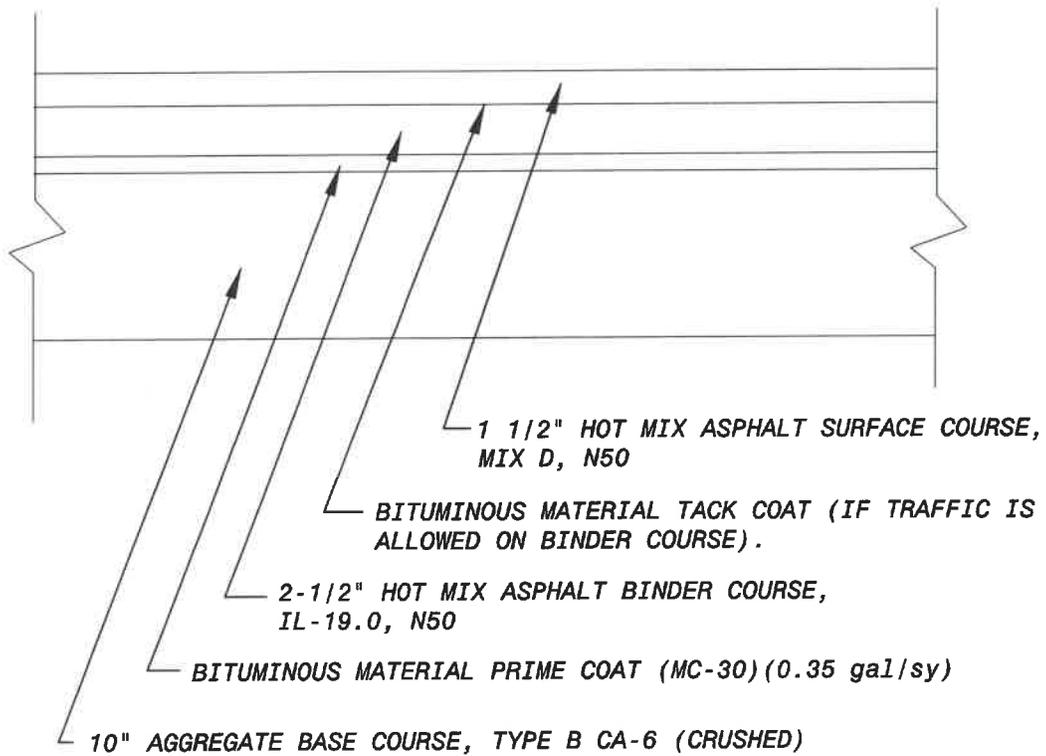
VILLAGE OF MUNDELEIN
ENGINEERING DETAILS

OPEN CUT ROADWAY
PATCHING / PAVEMENT
REMOVAL AND REPLACEMENT
(NEW UTILITY
CONNECTIONS)

DETAIL NO.

R-7

REVISIONS				REVISIONS			
REV.	BY	DATE:	REVISION:	REV.	BY	DATE:	REVISION:
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2.	JRB	01-01-19	APPROVED	5.			
3.				6.			

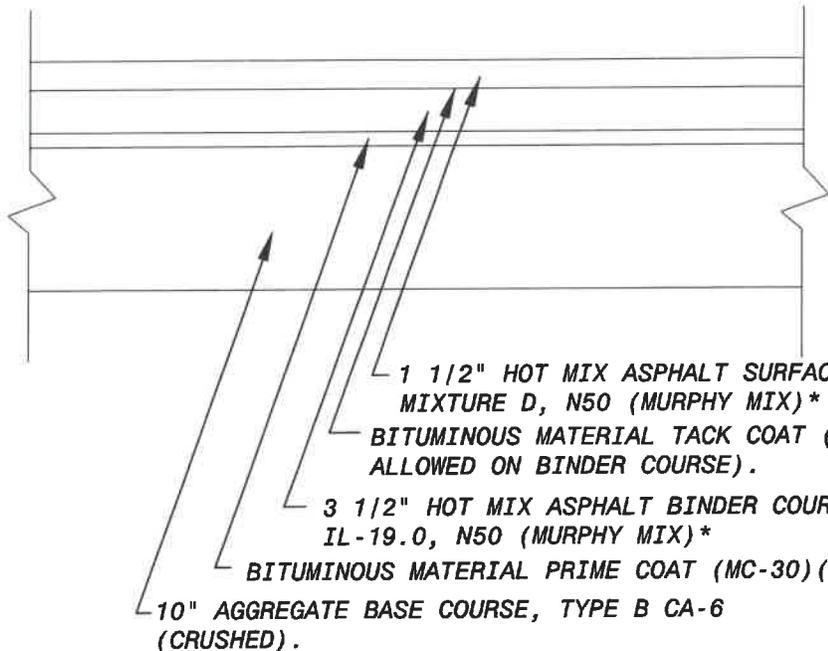


VILLAGE OF MUNDELEIN
ENGINEERING DETAILS

PARKING LOT TYPICAL
PAVEMENT SECTION

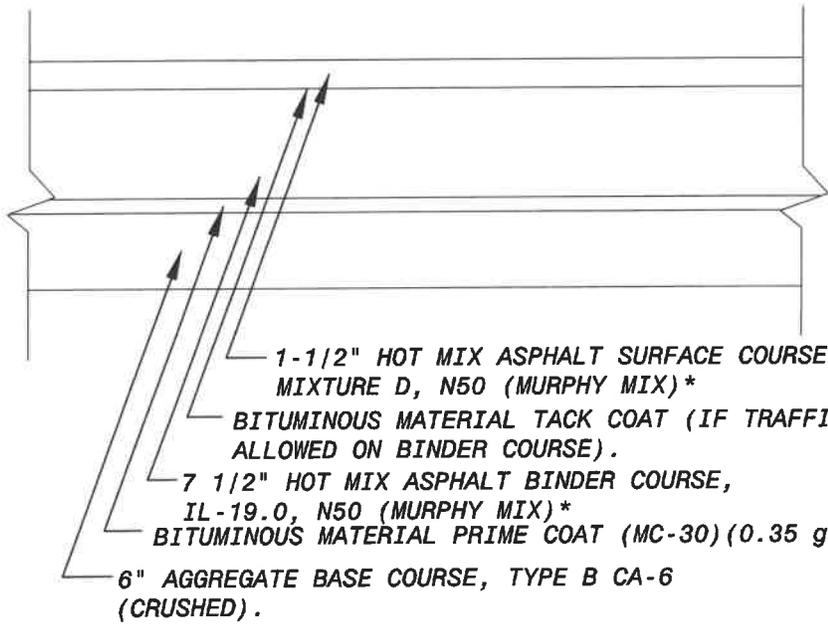
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REV.	BY	DATE	REVISION	REV.	BY	DATE	REVISION
1.	MDJ	04-04-05	APPROVED	4.			
2.	JRB	01-01-19	APPROVED	5.			
3.				6.			

DETAIL NO.
R-8



1 1/2" HOT MIX ASPHALT SURFACE COURSE,
MIXTURE D, N50 (MURPHY MIX)*
BITUMINOUS MATERIAL TACK COAT (IF TRAFFIC IS
ALLOWED ON BINDER COURSE).
3 1/2" HOT MIX ASPHALT BINDER COURSE,
IL-19.0, N50 (MURPHY MIX)*
BITUMINOUS MATERIAL PRIME COAT (MC-30)(0.35 gal/sy)
10" AGGREGATE BASE COURSE, TYPE B CA-6
(CRUSHED).

**LOCAL STREET
PAVEMENT SECTION**
(STRUCTURAL NUMBER = 3.0 MINIMUM)



1-1/2" HOT MIX ASPHALT SURFACE COURSE,
MIXTURE D, N50 (MURPHY MIX)*
BITUMINOUS MATERIAL TACK COAT (IF TRAFFIC IS
ALLOWED ON BINDER COURSE).
7 1/2" HOT MIX ASPHALT BINDER COURSE,
IL-19.0, N50 (MURPHY MIX)*
BITUMINOUS MATERIAL PRIME COAT (MC-30)(0.35 gal/sy)
6" AGGREGATE BASE COURSE, TYPE B CA-6
(CRUSHED).

**COLLECTOR / INDUSTRIAL
PAVEMENT SECTION**
(STRUCTURAL NUMBER = 3.85 MINIMUM)

***NOTE:**
AIR VOIDS TO BE 3.5% @ 50 GYR

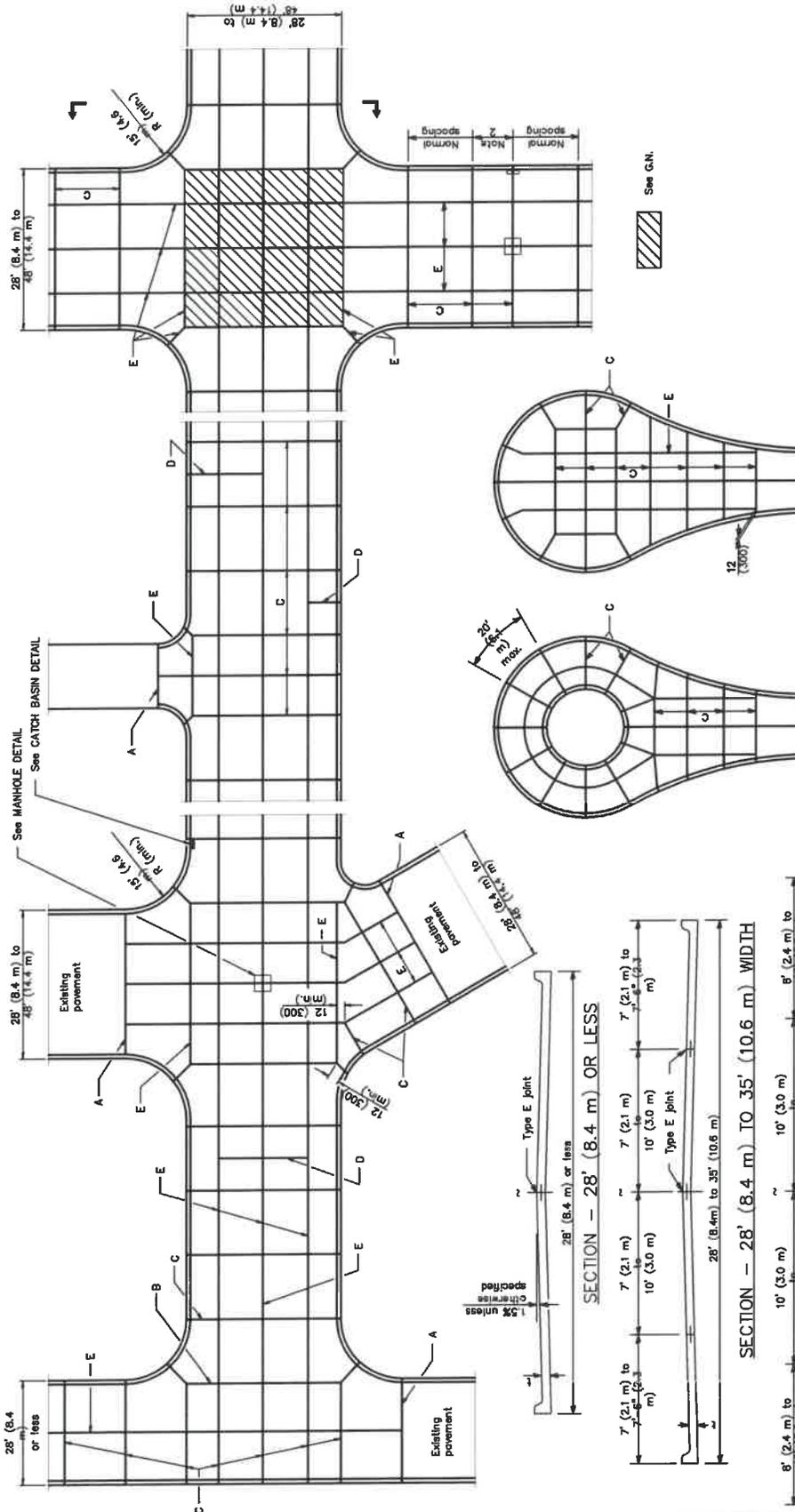


VILLAGE OF MUNDELEIN
ENGINEERING DETAILS

LOCAL & COLLECTOR /
INDUSTRIAL STREETS
TYPICAL PAVEMENT
SECTION

REVISIONS				REVISIONS			
REV.	BY	DATE:	REVISION:	REV.	BY	DATE:	REVISION:
1.	MDJ	04-04-05	APPROVED	4.			
2.	JRB	01-01-19	APPROVED	5.			
3.				6.			

DETAIL NO.
R-9



All dimensions are in inches (millimeters) unless otherwise shown.

CUL DE SAC FULLY PAVED

CUL DE SAC OPEN CENTER

t = See typical cross section on plans for thickness



VILLAGE OF MUNDELEIN
ENGINEERING DETAILS

LOCAL STREET
TYPICAL CONCRETE
PAVEMENT SECTION
(1 of 2)

REVISIONS			
REV.	BY	DATE:	REVISION:
1.	JRB	01-01-19	APPROVED
2.			
3.			

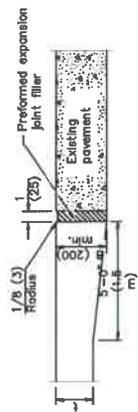
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5.			
6.			

DETAIL NO.
R-9C

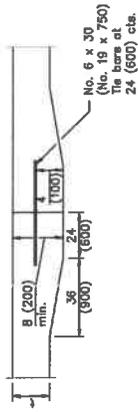
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1.	JRB	01-01-19	APPROVED
2.			
3.			

REVISIONS			
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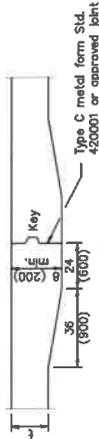
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R-9C



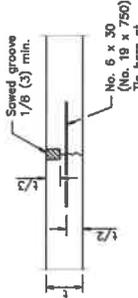
TYPE A
EXPANSION JOINT



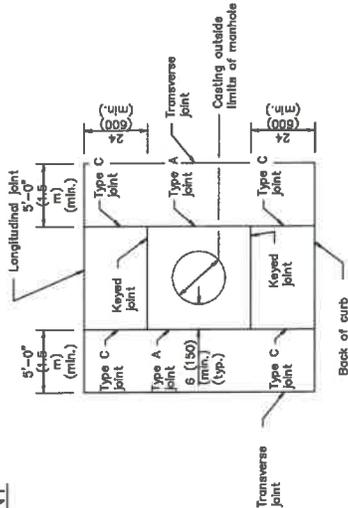
TYPE D
TIED TRANSVERSE CONSTRUCTION JOINT



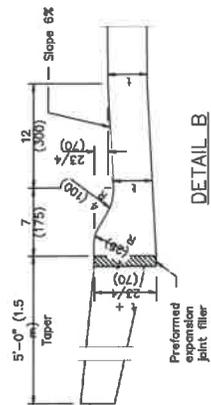
TYPE B
KEYED JOINT



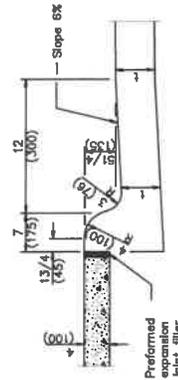
TYPE E
SAWED LONGITUDINAL JOINT



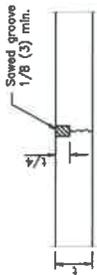
MANHOLE DETAIL
Showing joint types



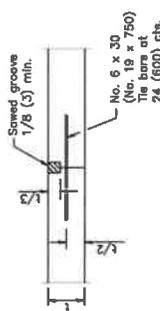
CATCH BASIN DETAIL



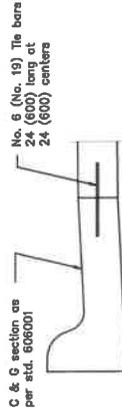
DETAIL A



TYPE C
SAWED TRANSVERSE JOINT



TYPE E
LONGITUDINAL CONSTRUCTION JOINT



COMB, CURB & GUTTER DETAIL



INTEGRAL CURB
See DETAIL A for curbside
and DETAIL B for driveways

GENERAL NOTES

All catch basins shall be separated from the pavement and curb by bonding in the detail. Manhole castings within the pavement limits shall be bonded to the pavement except when telescoping type castings are used.

When a joint falls within 5 ft. (1.5 m) of or contacts basins, manholes, or other structures, shorten one or more panels either side of opening to permit joint to fall at the corners of the box out.

When specified, roundouts as shown on Standard 420111 shall be used in lieu of the manhole detail shown herein.

All transverse joints must extend through curbs and be continuous across pavement, except tied transverse construction joints. Expansion joints will be required as shown on the plans.

When specified, the pavement structure thickness at intersections shall be increased. This requirement generally will occur when the design traffic through the intersection exceeds the typical design of the pavement structure either side of the intersection.

Joints shall be sawed to a depth of 1/4 for transverse joints and 1/3 for longitudinal joints. Saw joints shall be sealed with material meeting the requirements of Section 1050 of the Standard Specifications.

This alternate construction is at the Contractor's option and shall be constructed in accordance with Section 606 of the Standard Specifications. The combination concrete curb and gutter shall be measured in place and the area computed in sq. yards (sq. meters). This work will be paid for at the contract unit prices per sq. yards (sq. meters) for portland cement concrete pavement specified with integral curb of the thickness specified and shall include all materials and labor.

Transverse joint spacing shall not exceed 15 ft. (4.6 m).

Construct TYPE D tied transverse construction joint when construction joint does not fall at a TYPE C sawed transverse joint.

Required Pavement & Right-of-Way Widths		
Type of Street	Pavement Width (Edge to Edge)	Right-of-Way Width
Local	33-feet	66-feet
Industrial	36-feet	80-feet
Collector	36-feet – 60-feet	80-feet – 100-feet

Required Minimum Horizontal Street Radius	
Type of Street	Minimum Centerline Radius
Local	250-feet
Industrial	400-feet
Collector	350-feet

Reflectorized Street Name Signs

Length and width:

Mounted street name signs shall have a standard width of nine (9)-inches. The overall length of the face and blade shall be determined by the number of letters in the street name, including the prefixes and suffixes. The name plate shall have a minimum length of 30-inches or as requested. Where extra length is required, it shall be provided in six (6)-inch increments.

Sign Face:

Sign blanks are to be flat .080 aluminum.

All cut uppercase letters are to be six (6)-inches in height, lowercase letters to be three (3)-inches in height.

All compass prefix and suffix letters are to be three (3)-inches in height.

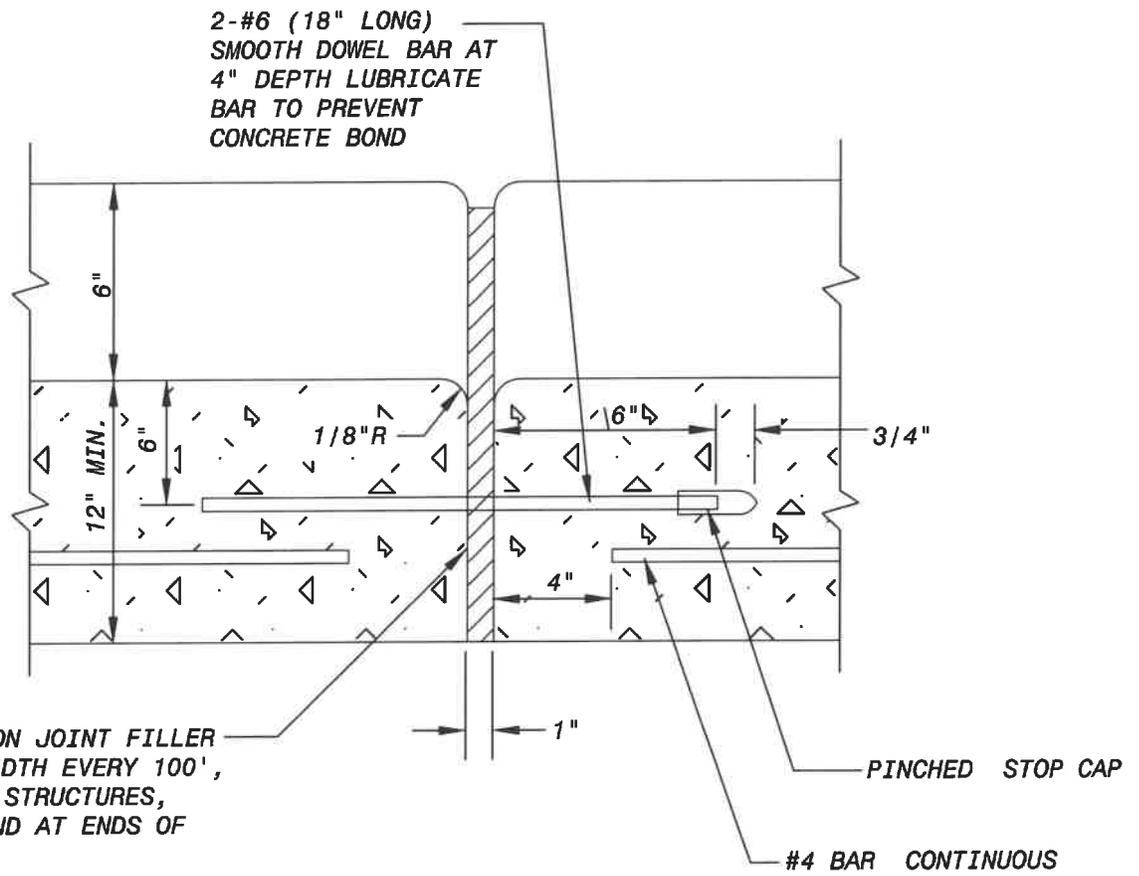
Sign blanks are to be faced with 3M VIP Diamond Grade (White) sheeting.

White base material shall be covered with Green EC (electronically cut) film with 3/4-inch borders.

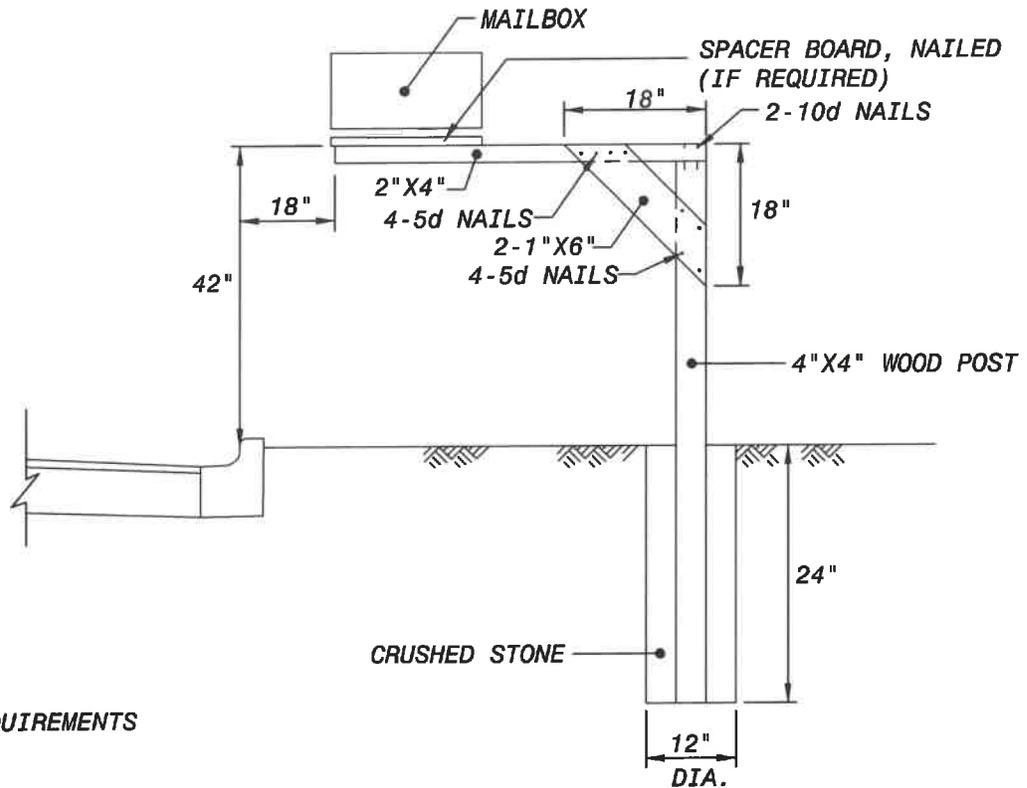
Traffic Control Signs

Stop signs shall be 30-inches x 30-inches with 3M VIP Diamond Grade reflective sheeting.

Yield signs shall be 30-inches with 3M VIP Diamond Grade reflective sheeting.



REVISIONS				REVISIONS			
REV.	BY	DATE	REVISION	REV.	BY	DATE	REVISION
1.	MDJ	04-04-05	APPROVED	4.			
2.	JRB	01-01-19	APPROVED	5.			
3.				6.			



RESIDENTIAL MAILBOX REQUIREMENTS

STRUCTURE:

NOTE: STRUCTURE ORNAMENTAL MONUMENT TYPE MAILBOXES, WHICH DO NOT MEET THE FOLLOWING REQUIREMENTS, ARE NOT PERMITTED.

THE MAILBOX IS TO BE OF LIGHT STEEL, ALUMINUM, PLASTIC, OR SIMILAR WEIGHT MATERIALS AND NOT EXCEED 11 POUNDS. IT SHALL MEET U.S. POSTAL SERVICE REGULATIONS.

THE MAILBOX POST IS TO BE A SINGLE 4" BY 4" WOOD POST, A 4 1/2" DIAMETER WOOD POST, OR A METAL POST WITH STRENGTH NO GREATER THAN A 2" IN DIAMETER STANDARD STEEL PIPE. A METAL POST SHALL NOT BE FITTED WITH AN ANCHOR PLATE, BUT MAY HAVE AN ANTI-TWIST DEVICE THAT EXTENDS NO MORE THAN 10" BELOW THE GROUNDS SURFACE.

THE MAILBOX POST SHALL BE EMBEDDED INTO THE GROUND 24". POST NOT ALLOWED TO BE SET IN CONCRETE.

THE MAILBOX POST SHALL NOT BE EMBEDDED OVER 24" INTO THE GROUND TO ALLOW POST TO BREAK RATHER THAN BE A SAFETY HAZARD TO MOTORISTS.

THE POST-TO-BOX ATTACHMENT SHOULD BE OF SUFFICIENT STRENGTH TO PREVENT THE BOX FROM SEPARATING FROM THE POST IF A CAR STRIKES THE INSTALLATION.

LOCATION:

MAILBOXES SHALL BE PLACED 12" FROM THE FACE OF THE CURB TO THE FACE OF THE MAILBOX. EXISTING PAVED ROADS WITHOUT CURBS SHALL REQUIRE THE FACE OF THE MAILBOX TO BE SETBACK THE WIDTH OF THE SHOULDER, PLUS 12".

THE MAILBOX SHALL BE MOUNTED NOT MORE THAN 52" FROM THE GROUND TO THE TOP OF THE BOX, AND NO LESS THAN 42" FROM THE GROUND TO THE BOTTOM OF THE BOX.

FOR FURTHER REQUIREMENTS CONTACT THE MUNDELEIN POST OFFICE.



VILLAGE OF MUNDELEIN
ENGINEERING DETAILS

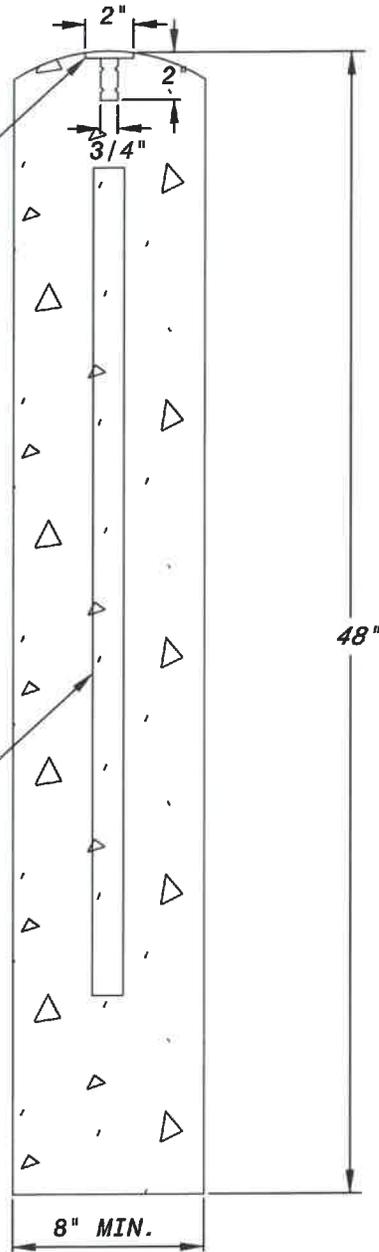
STANDARD MAILBOX
SUPPORTS

REVISIONS				REVISIONS			
REV.	BY	DATE:	REVISION:	REV.	BY	DATE:	REVISION:
1.	MDJ	04-04-05	APPROVED	4.			
2.	JRB	01-01-19	APPROVED	5.			
3.				6.			

DETAIL NO.
R-14

MINIMUM 2" DOMED CONCRETE MARKER (ALUMINUM) (BERNSTEN CD2 OR EQUIVALENT) WITH ACTUAL CORNER POSITION STAMPED ON MARKER.

5/8" REBAR 30" TO 36" LENGTH



BERNSTEN CD2 OR EQUIVALENT

NOTES

1. MONUMENT COORDINATES SHALL BE ESTABLISHED USING NAD83 (1986 OR 1997)
2. MONUMENT ELEVATION SHALL BE ESTABLISHED USING NAVD88

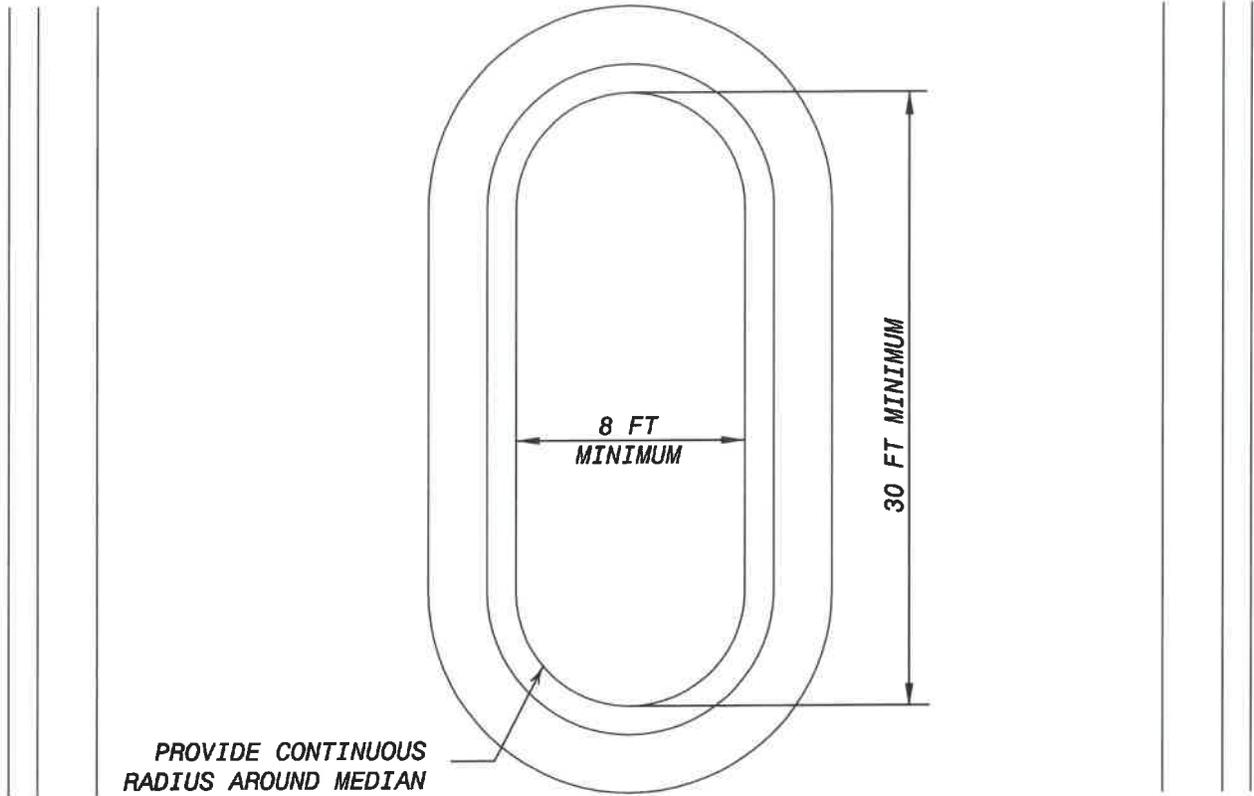


VILLAGE OF MUNDELEIN
ENGINEERING DETAILS

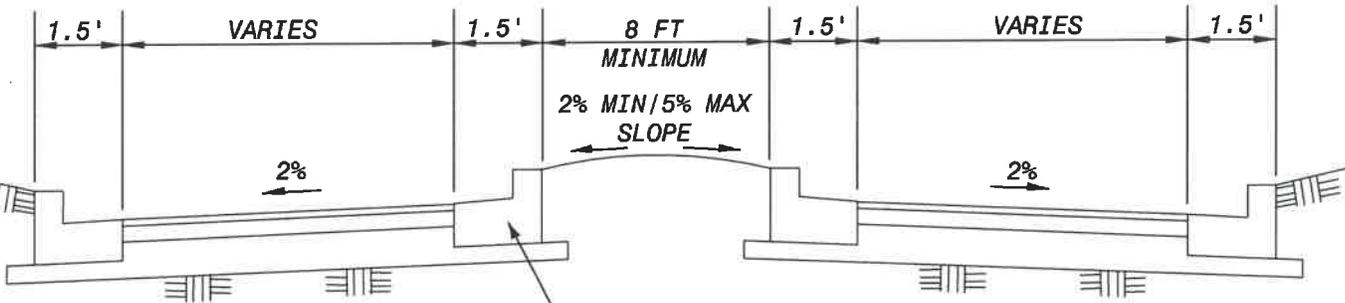
BENCHMARK MONUMENT

REVISIONS				REVISIONS			
REV.	BY	DATE	REVISION	REV.	BY	DATE	REVISION
1.	MDJ	04-04-05	APPROVED	4.			
2.	JRB	01-01-19	APPROVED	5.			
3.				6.			

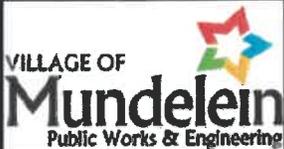
DETAIL NO.
R-15



PLAN VIEW



CURB TO BE CONSTRUCTED TO DRAIN OUT TO PAVEMENT IN AREAS WHERE NO STORM COLLECTION HAS BEEN PROVIDED.



VILLAGE OF MUNDELEIN
ENGINEERING DETAILS

ROADWAY MEDIAN DETAIL

REVISIONS				REVISIONS			
REV.	BY	DATE:	REVISION:	REV.	BY	DATE:	REVISION:
1.	JRB	06-20-16	APPROVED	4.			
2.	JRB	01-01-19	APPROVED	5.			
3.				6.			

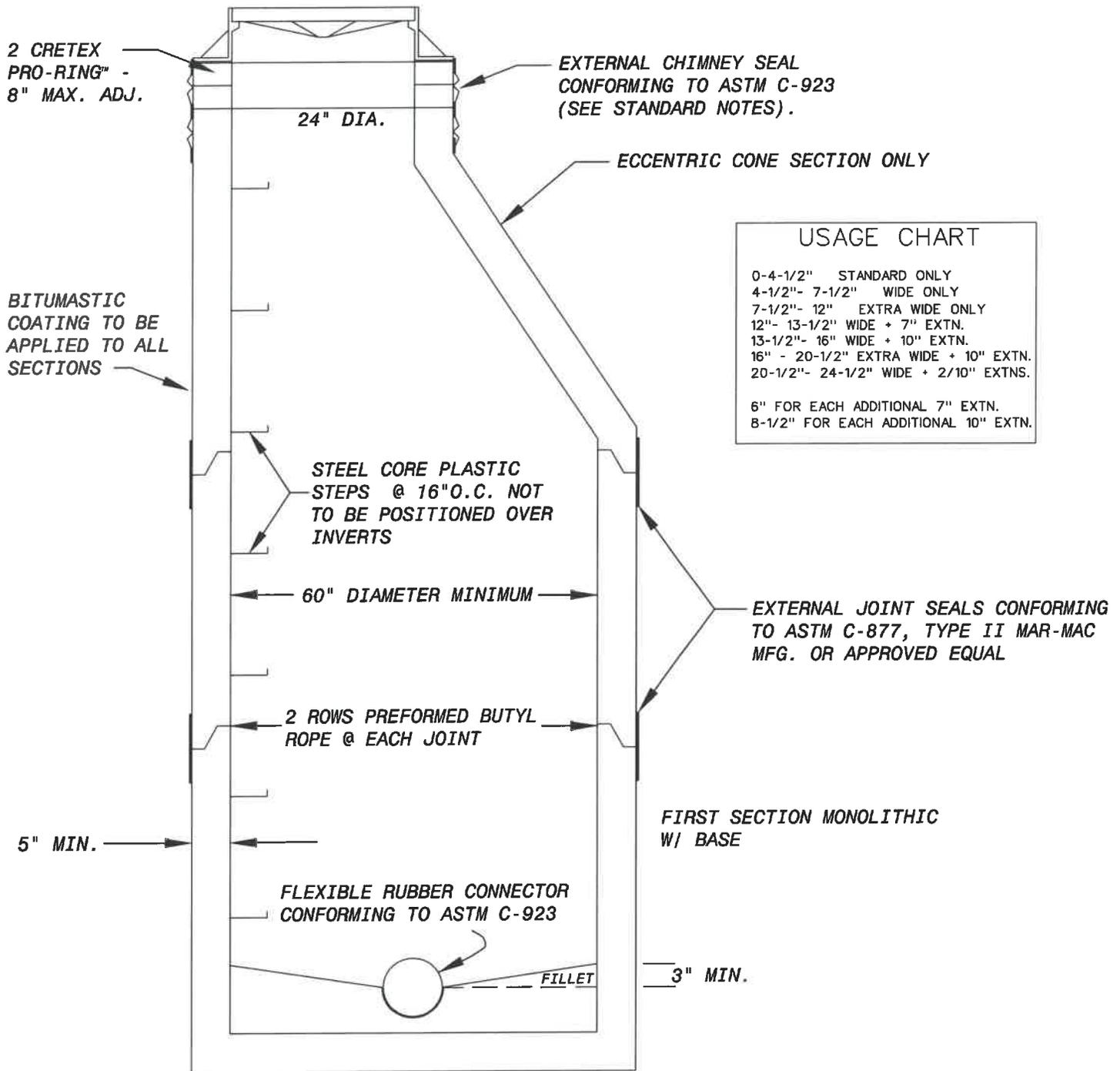
DETAIL NO.
R-16

Miscellaneous Sanitary Standards/Notes

1. Sanitary sewers, main, and services and their fittings shall be constructed of one (1) or more of the following materials:
 - a. PVC pipe, ASTM D-3034, SDR 26, with elastomeric gasket joints conforming to ASTM D-3212.
 - b. Ductile iron pipe Class 52 with joints conforming to ANSI A21.11. Only when approved for structural purposes by the Village Engineer.
2. Sanitary sewer manholes shall be five (5)-feet zero (0)-inches diameter precast structures. Frames shall be Neenah R1712-C or EAST Jordan 1050 HD with self-sealing application lids with concealed pick holes. Lids shall be imprinted with the word "Sanitary" and "Village of Mundelein."
3. Sanitary sewer manholes and inspection manholes shall have eccentric cones and waterproof asphaltic bitumastic coating. All manhole sections shall be securely sealed to each other using pre-formed bituminous mastic such as "RAM-NEK." This mastic shall be applied in such a manner that ground water inflow cannot enter the manhole through gaps between barrel sections or cone sections and adjusting rings. Double "TAR STICK" may be required in areas with high water tables. External "CRETEX" brand chimney seals, "WRAPID" Seal Heat Shrinkable Sleeve (CCI Pipeline Systems), or approved equivalent shall be installed in all manholes. "MAC RAP" is to be used at all manhole section joints.
4. Water stop gaskets shall be provided at all sanitary sewer manhole/pipe connections as approved by the Village Engineer.
5. Sanitary sewer service risers shall be used when sewer main exceeds 12-feet in depth. The bedding under the riser tee shall be thoroughly compacted. The engineer reserves the right to require concrete encasement of the riser or a concrete thrust block under the tee.
6. All sanitary sewers including service stubs shall be subject to an air test Section 31 of the Standard Specifications. Applicable portions of main line sewer including main with riser sections shall be subjected to a deflection test conducted by the contractor. All testing shall be observed by a Village of Mundelein Engineering Department Representative.
7. The main sanitary sewer shall be televised prior to acceptance. A videotape, CD, or DVD along with a paper report shall be submitted to the Village of Mundelein Engineering Department. The paper reports shall include the following: Date, time, street name, manhole numbers from and to, manhole depths, pipe size, pipe type, direction televised, surface conditions, clock position of services, final distances in feet, and observation details with footage. (Include still photos for each observation that is indicated.) The contractor, without delay, shall perform all necessary corrective work.
8. Control and sampling manholes must be installed so they are accessible at all times by the Village of Mundelein on a straight portion of the line without any bends inside the manhole or within five (5)-feet of the exterior of the manhole. In the event that a grease trap is needed, the grease trap shall precede the sample manhole. The grease waste service must connect to a main service before the sample manhole.
9. All sump pumps must discharge to the storm sewer system. All interior floor drains and waste ejector pits must connect to the sanitary sewer system.
10. All sanitary sewer stubs shall be marked with 4x4 post painted red in new developments.
11. Structures, manholes, inlets, catch basin sumps, and valve vaults shall be cleaned prior to any inspection at the end of the project and prior to Village acceptance. Sanitary and storm sewer main shall be jet cleaned if evidence of debris build-up is present at the time of Village acceptance.
12. Connections to any existing manhole shall be done using a KOR-N-SEAL connection.

13. Adjusting rings to be expanded polypropylene (Cretex PRO-RING™) and sealed with Manufacturer approved structural sealant/adhesive. No concrete adjustment rings are to be used.
14. All external drains shall connect to the storm sewer system.
15. Vehicle and truck dock drains must meet the plumbing code requirements, including waste interceptors, and must be approved by the Village Plumbing Inspector.
16. When existing stubs are not available, all service connections to mainline sewers shall consist of the following:
 - a. If existing sewer is PVC or clay pipe, the mainline sewer shall be cut and a wye section with chamfer shall be installed with non-shear mission coupling placed over connection points; for clay, a minimum of two (2)-feet of PVC is required on each side of wye;
 - b. Existing stubs or services planned for use must be televised and verified by the Village of Mundelein to be in acceptable condition prior to use or reuse; and
 - c. Break in connections are not permitted.

9" HEAVY DUTY FRAME
NEENAH FOUNDRY CO. R1713 W/ SELF SEALING LID
IMPRINTED W/ "VILLAGE OF MUNDELEIN" & "SANITARY"
(OR EQUIVALENT E.J.I.W. PRODUCT)

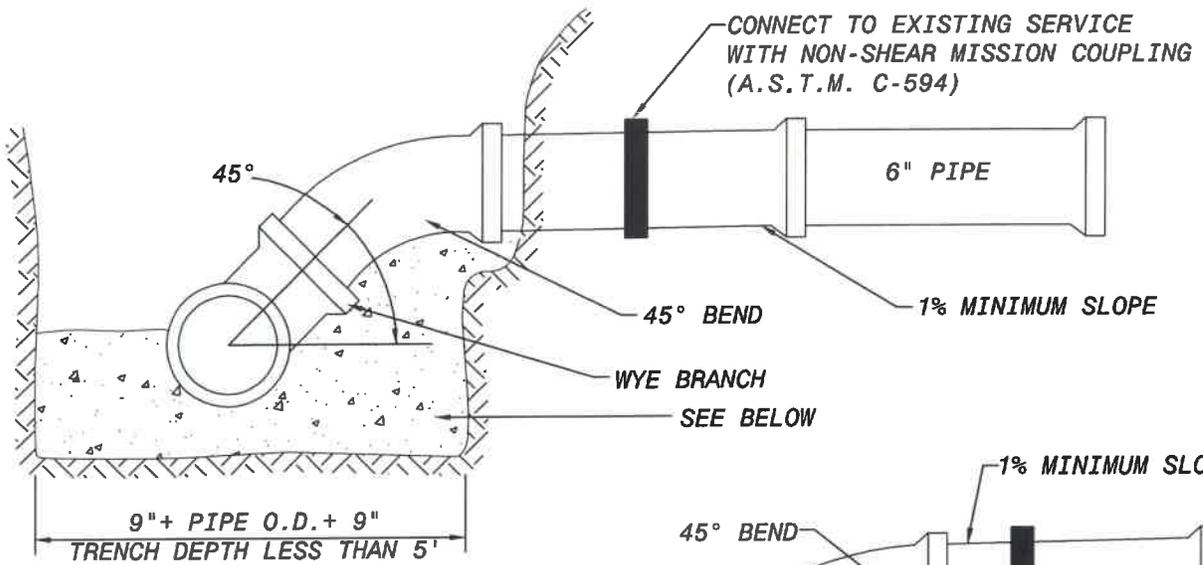


VILLAGE OF MUNDELEIN
 ENGINEERING DETAILS

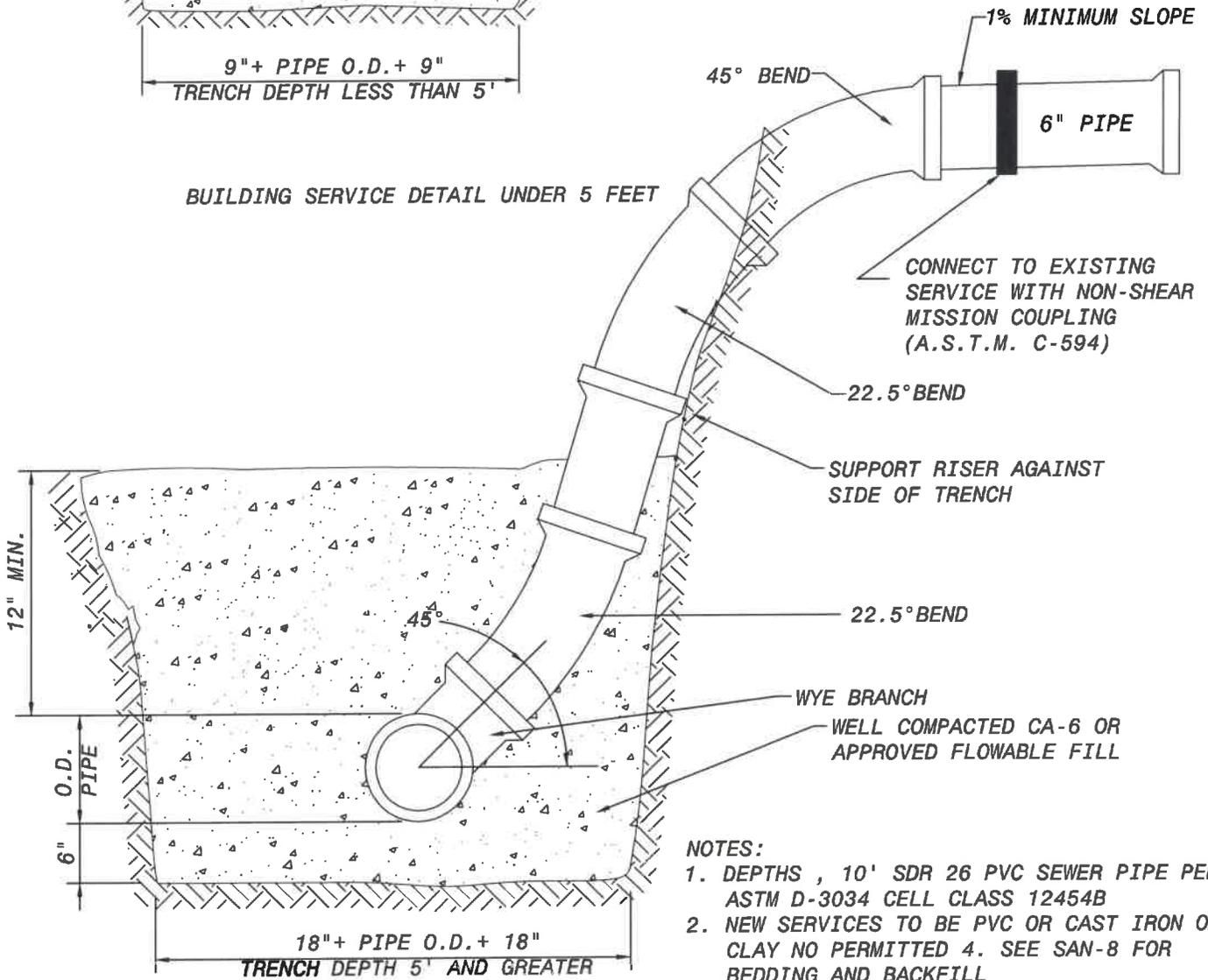
SANITARY MANHOLE
 TYPE I

REVISIONS				REVISIONS			
REV.	BY	DATE:	REVISION:	REV.	BY	DATE:	REVISION:
1.	MDJ	04-04-05	APPROVED	4.			
2.	JRB	04-14-15	APPROVED	5.			
3.	JRB	01-01-19	APPROVED	6.			

DETAIL NO.
SAN-1



BUILDING SERVICE DETAIL UNDER 5 FEET



NOTES:

1. DEPTHS , 10' SDR 26 PVC SEWER PIPE PER ASTM D-3034 CELL CLASS 12454B
2. NEW SERVICES TO BE PVC OR CAST IRON ONLY CLAY NO PERMITTED
4. SEE SAN-8 FOR BEDDING AND BACKFILL
3. SEE SAN-08 FOR BEDDING AND BACKFINLL.

REVISIONS				REVISIONS			
REV.	BY	DATE	REVISION	REV.	BY	DATE	REVISION
1.	MDJ	04-04-05	APPROVED	4.			
2.	JRB	01-01-19	APPROVED	5.			
3.				6.			

HEAVY DUTY FRAME W/ SELF SEALING / LOCKING LID

(NEENAH FOUNDRY LIFTMATE R-1650-LM SPECIAL/PARENT #165-960)
 IMPRINTED W/ "VILLAGE OF MUNDELEIN" & "SANITARY" AND LOCKING MECHANISM

2 CRETEX
 PRO-RING™-
 8" MAX.
 ADJ.

EXTERNAL CHIMNEY SEAL
 CONFORMING TO ASTM C-923
 (SEE STANDARD NOTES)

24" DIA.

ECCENTRIC CONE SECTION ONLY

BITUMASTIC
 COATING TO BE
 APPLIED TO ALL
 SECTIONS

USAGE CHART

0-4-1/2" STANDARD ONLY
 4-1/2"- 7-1/2" WIDE ONLY
 7-1/2"- 12" EXTRA WIDE ONLY
 12"- 13-1/2" WIDE + 7" EXTN.
 13-1/2"- 16" WIDE + 10" EXTN.
 16" - 20-1/2" EXTRA WIDE + 10" EXTN.
 20-1/2"- 24-1/2" WIDE + 2/10" EXTNS.

6" FOR EACH ADDITIONAL 7" EXTN.
 8-1/2" FOR EACH ADDITIONAL 10" EXTN.

STEEL CORE PLASTIC STEPS
 @ 16" O.C. NOT TO BE
 POSITIONED OVER INVERTS

60" DIAMETER MINIMUM

EXTERNAL JOINT SEALS:
 CONFORMING TO ASTM C-877,
 TYPE II, MAR-MAC MANUFACTURER
 OR APPROVED EQUAL.

2 ROWS PREFORMED BUTYL
 ROPE @ EACH JOINT

5" MIN.

NOTE:
 FIRST SECTION MONOLITHIC W/ BASE

LOCATE IN R.O.W. AND/OR AS APPROVED
 BY THE VILLAGE OF MUNDELEIN.

FLEXIBLE RUBBER
 CONNECTOR CONFORMING
 TO ASTM C-923

FILLET

3" MIN.

NOTE:
 THIS MANHOLE MUST BE INSTALLED ON A STRAIGHT PORTION OF THE SANITARY SEWER
 SERVICE LINE WITHOUT BENDS INSIDE THE MANHOLE OR WITHIN 5 FEET OF THE MANHOLE
 EXTERIOR. INSTALL DOWNSTREAM OF THE GREASE SERVICE AND SANITARY SERVICE.



VILLAGE OF MUNDELEIN
 ENGINEERING DETAILS

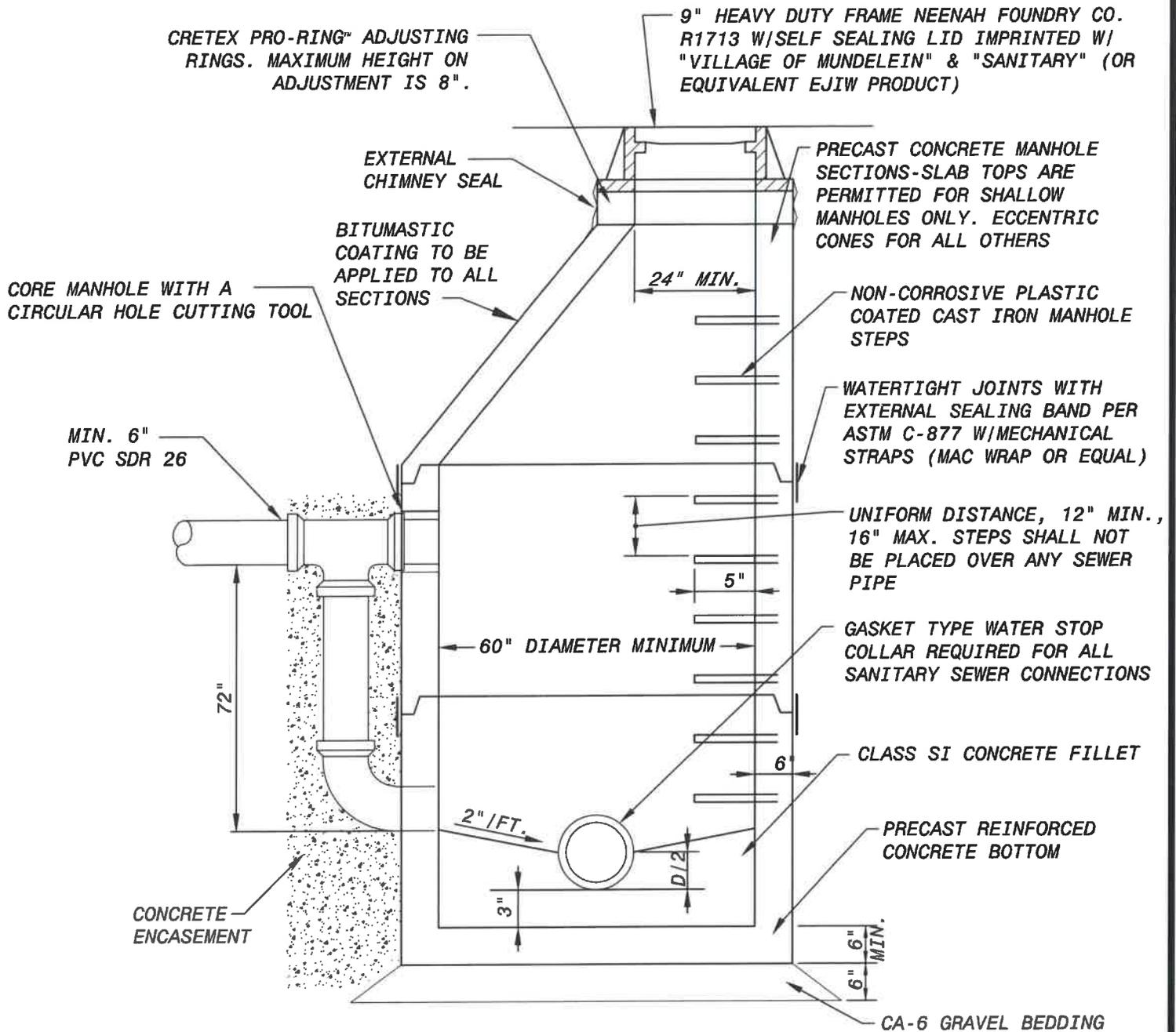
CONTROL AND SAMPLING
 SANITARY MANHOLE
 (INSPECTION)

REVISIONS			
REV.	BY	DATE	REVISION
1.	MDJ	04-04-05	APPROVED
2.	JRB	01-01-19	APPROVED
3.			

REVISIONS			
REV.	BY	DATE	REVISION
4.			
5.			
6.			

DETAIL NO.

SAN-3



NOTES:

1. ALL PIPE CONNECTION OPENINGS SHALL BE PRECAST WITH RESILIENT RUBBER WATER TIGHT PIPE SLEEVES.
2. ALL CONCRETE SECTIONS SHALL BE SET ON A PREFORMED BIT. PLASTIC GASKET (RUB-R-NEK OR EZ STIK)
3. FILL LUG HOLES WITH BITUMINOUS MASTIC JOINT MATERIAL.

USE DROP CONNECTIONS FOR ANY SANITARY SEWER PIPE ENTERING TWO (2) FEET OR MORE ABOVE THE LOWEST PIPE INVERT.

ALL PRECAST CONCRETE STRUCTURES MUST CONFORM TO AASHTO M199



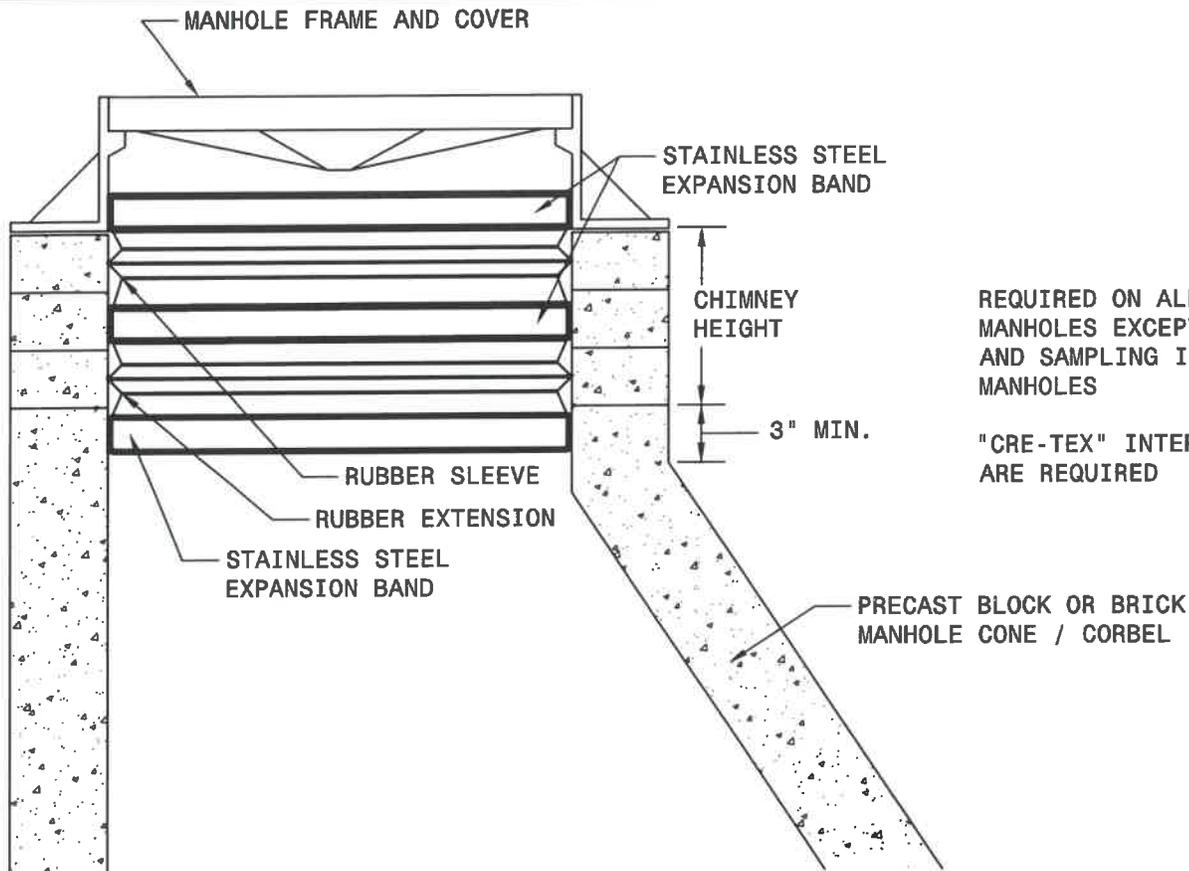
VILLAGE OF MUNDELEIN
ENGINEERING DETAILS

DROP MANHOLE
DETAIL

REVISIONS			
REV.	BY	DATE:	REVISION:
1.	NDJ	04-04-05	APPROVED
2.	JRB	01-01-19	APPROVED
3.			

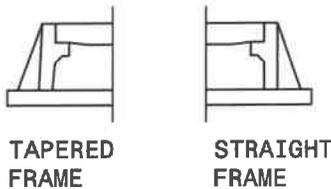
REVISIONS			
REV.	BY	DATE:	REVISION:
4.			
5.			
6.			

DETAIL NO.
SAN-4



REQUIRED ON ALL SANITARY MANHOLES EXCEPT FOR CONTROL AND SAMPLING INSPECTION MANHOLES

"CRE-TEX" INTERNAL SEALS ARE REQUIRED



NOTE:

MANHOLE FRAME-CHIMNEY SEAL - AN INTERNAL RUBBER SEAL SHALL BE INSTALLED ON ALL SANITARY MANHOLES ON THIS PROJECT. A RUBBER SEAL EXTENSION, TO COVER ANY ADDITIONAL HEIGHTS OF CHIMNEY NOT COVERED BY THE SEAL ITSELF, SHALL BE USED AS DIRECTED. THE INTERNAL RUBBER SEAL AND SEAL EXTENSIONS SHALL BE AS MANUFACTURED BY CRETEX SPECIALTY PRODUCTS, OR EQUAL. THE SLEEVES AND EXTENSIONS SHALL HAVE A MINIMUM THICKNESS OF 3/16 INCHES AND SHALL BE EXTRUDED OR MOLDED FROM A HIGH GRADE RUBBER COMPOUND CONFORMING TO THE APPLICABLE REQUIREMENTS OF ASTM C923, WITH A MINIMUM 1500 PSI TENSILE STRENGTH, MAXIMUM 18% COMPRESSION SET AND A HARDNESS (DUROMETER) OF 48±5. THE BANDS USED FOR COMPRESSING THE SLEEVE AND EXTENSION AGAINST THE MANHOLE SHALL BE FABRICATED FROM 16 GAUGE STAINLESS STEEL CONFORMING TO ASTM A240 TYPE 304. ANY SCREW BOLTS OR NUTS USED ON THIS BAND SHALL BE STAINLESS STEEL CONFORMING TO ASTM F593 AND 594, TYPE 304. CEMENT MORTAR SHALL BE USED IN THE JOINT BETWEEN THE MANHOLE FRAME AND CHIMNEY OR CONE. DETAILED INSTALLATION PROCEDURES SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS. THE SLEEVE SHALL BE DOUBLE PLEATED WITH A MINIMUM UNEXPANDED VERTICAL HEIGHT OF 8 INCHES AND BE CAPABLE OF VERTICAL EXPANSION OF NO LESS THAN 2 INCHES WHEN INSTALLED. ALL COSTS FOR THE FURNISHING AND INSTALLATION OF THE INTERNAL RUBBER SEAL AND EXTENSION SHALL BE INCLUDED IN THE UNIT PRICE BID FOR SANITARY MANHOLES.

USAGE CHART

0-4-1/2" CHIMNEY SEAL ONLY
 OVER 4-1/2"- 10-1/2" SEAL + 7" EXTENSION
 OVER 10-1/2" - 13" SEAL + 10" EXTENSION
 OVER 13" SEAL + MULT. EXTENSIONS
 +6" FOR EACH ADDED 7" EXTENSION
 +8" FOR EACH ADDED 10" EXTENSION
 NOTE: FRAME OFFSETS AND DIAMETER DIFFERENTIALS WILL REDUCE THESE SPAN HEIGHTS.



VILLAGE OF MUNDELEIN
 ENGINEERING DETAILS

SANITARY SEWER
 INTERNAL CHIMNEY
 SEAL DETAIL

REVISIONS				REVISIONS			
REV.	BY	DATE	REVISION:	REV.	BY	DATE	REVISION:
1.	MDJ	04-04-05	APPROVED	4.			
2.	JRB	01-01-19	APPROVED	5.			
3.				6.			

DETAIL NO.
 SAN-5

9" HEAVY DUTY MANHOLE FRAME AND SELF SEALING LID (SEE DETAIL SAN-11)

CRETEX PRO-RING™ ADJUSTING RINGS. MAXIMUM HEIGHT ON ADJUSTMENT IS 8".

EXTERNAL CHIMNEY SEAL

CAST-IN-PLACE CONCRETE AROUND PIPE

BITUMASTIC COATING TO BE APPLIED TO ALL SECTIONS

PRECAST CONCRETE MANHOLE SECTIONS-SLAB TOPS ARE PERMITTED FOR SHALLOW MANHOLES ONLY. ECCENTRIC CONES FOR ALL OTHERS

NON-CORROSIVE PLASTIC COATED CAST IRON MANHOLE STEPS

WATERTIGHT JOINTS WITH EXTERNAL SEALING BAND PER ASTM C-877 W/MECHANICAL STRAPS (MAC WRAP OR EQUAL)

UNIFORM DISTANCE, 12" MIN., 16" MAX. STEPS SHALL NOT BE PLACED OVER ANY SEWER PIPE

PIPE
DETAIL

SEWAGE AIR
RELEASE VALVE

2" SHUT-OFF
VALVE

TEE

GASKET TYPE WATERSTOP
COLLAR FOR ALL SANITARY
SEWER CONNECTIONS

SHUT-OFF VALVE

PRECAST REINFORCED
CONCRETE BOTTOM

4" MIN.
6" MIN.

CA-6 GRAVEL BEDDING

72" FOR 60" DIA.

MEGA-LUG
CONNECTION

ALL PRECAST CONCRETE STRUCTURES MUST
CONFORM TO AASHTO M199



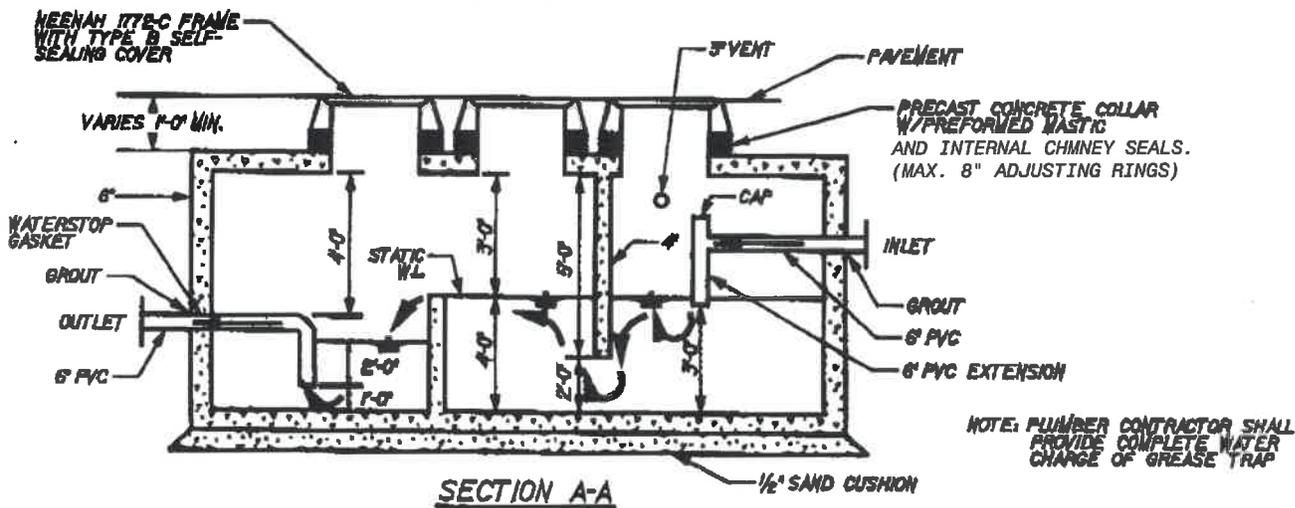
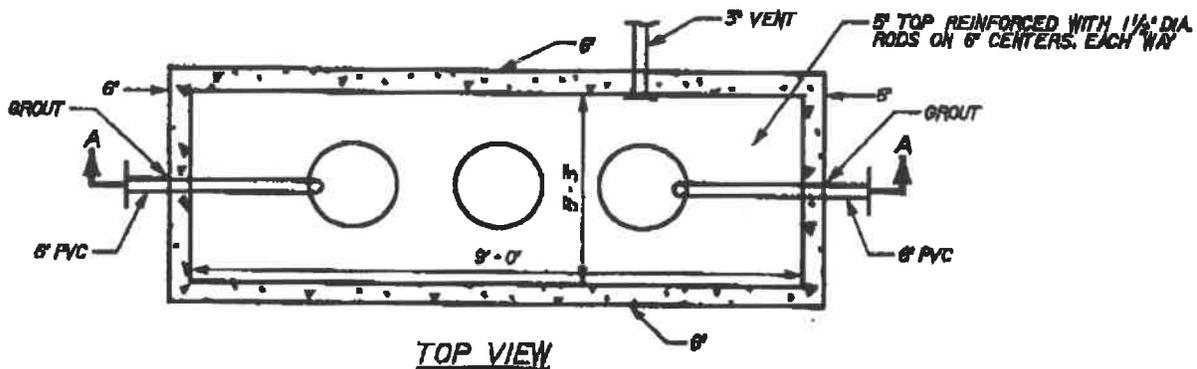
VILLAGE OF MUNDELEIN
ENGINEERING DETAILS

SANITARY SEWER
AIR RELEASE
MANHOLE DETAIL

REVISIONS			
REV.	BY	DATE	REVISION
1.	MDJ	04-04-05	APPROVED
2.	JRB	01-01-19	APPROVED
3.			

REVISIONS			
REV.	BY	DATE	REVISION
4.			
5.			
6.			

DETAIL NO.
SAN-6



NOTE: PLUMBER CONTRACTOR SHALL PROVIDE COMPLETE WATER CHARGE OF GREASE TRAP

NOTES:

1. PROVIDE CAPACITY CALCULATIONS TO CDD MINIMUM CAPACITY AT STATIC WATER LEVEL IS 1000 GALLONS.
2. PROVIDE ACCESS PORTS WITH SELF-SEALING LIDS FOR EACH COMPARTMENT.
3. USE NON-CORROSIVE MATERIALS.
4. MAXIMUM ALLOWABLE GREASE DISCHARGE AS PER GENERAL SEWER ORDINANCE (100 MG/L)
5. REGULARLY SCHEDULED CLEANING REQUIRED (MINIMUM OF ONCE PER MONTH).
6. GREASE DISSOLVING ENZYMES ARE PROHIBITED.
7. INSPECTION BY CDD IS REQUIRED PRIOR TO INITIAL CHARGING. THEREAFTER, CDD AND PUBLIC WORKS SHALL BE ALLOWED TO CONDUCT PERIODIC INSPECTIONS.
8. STANDARD SANITARY FRAMES & SEAL TIGHT LIDS (SEE SANITARY MANHOLE DETAIL INCLUDING INTERNAL CHIMNEY SEAL)
9. LOCATION: OUTSIDE AND EASILY ACCESSIBLE FOR CLEANING AND INSPECTION.
10. BAFFLE RUNS FROM FLOOR TO CEILING WITH A 1' HIGH x 2' WIDE SLOT PLACED IN THE CENTER OF THE BAFFLE LOCATED 18" ABOVE THE FLOOR. BAFFLE MAY BE CONSTRUCTED OUT OF CONCRETE, FIBERGLASS OR PLASTIC.
11. BATHROOM WASTE LINES ARE TO BE ROUTED AROUND GREASE TRAP. AT NO TIME SHALL THEY BE CONNECTED TO STRUCTURE



VILLAGE OF MUNDELEIN
ENGINEERING DETAILS

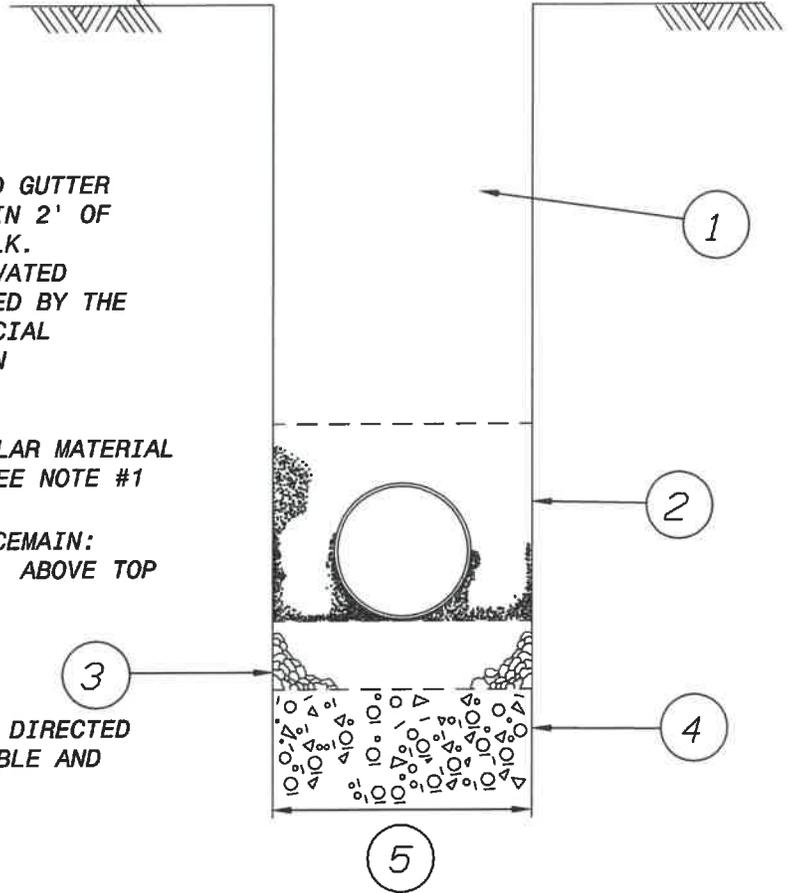
GREASE TRAP

REVISIONS				REVISIONS			
REV.	BY	DATE:	REVISION:	REV.	BY	DATE:	REVISION:
1.	MDJ	04-04-05	APPROVED	4.			
2.	JRB	04-14-15	APPROVED	5.			
3.	JRB	01-01-19	APPROVED	6.			

DETAIL NO.

SAN-7

FINISHED GRADE



- ① TRENCH BACKFILL UNDER PAVEMENT, CURB AND GUTTER AS INDICATED IN ROAD SUBGRADES AND WITHIN 2' OF ANY PROPOSED CURB AND GUTTER OR SIDEWALK. MECHANICALLY COMPACTED BACKFILL OF EXCAVATED MATERIALS IN OTHER LOCATIONS IF APPROVED BY THE ENGINEER. REFER TO TRENCH BACKFILL SPECIAL PROVISIONS FOR MATERIALS AND COMPACTION REQUIREMENTS.
- ② FOR SANITARY SEWER PVC: COMPACTED GRANULAR MATERIAL CA-6 TO 12" ABOVE TOP OF PIPE. (ALSO SEE NOTE #1 BELOW)
FOR SANITARY SEWER DIP, WATER MAIN, FORCEMAIN: COMPACTED GRANULAR MATERIAL CA-6 TO 12" ABOVE TOP OF PIPE (ALSO SEE NOTE #1 BELOW)
- ③ 6" COMPACTED BEDDING, CA-6 GRADATION
- ④ UNSUITABLE MATERIAL TO BE REMOVED WHERE DIRECTED BY THE ENGINEER AND REPLACED WITH SUITABLE AND COMPACTED MATERIAL
- ⑤ TRENCH WIDTH - PIPE O.D. + 12" MINIMUM
PIPE O.D. + 18" MAXIMUM

NOTES:

- 1. PVC PIPE CONFORMING TO THE SDR SPECIFIED IN THE PLANS SHALL BE INSTALLED TO THE LATEST REVISED SPECIFICATION REQUIREMENTS OF ASTM D2321 USING EITHER COMPACTED CLASS I OR CLASS II GRANULAR MATERIALS FOR BEDDING, HAUNCHING AND INITIAL BACKFILL OF 12" OVER THE TOP OF PIPE TO PROVIDE THE NECESSARY SUPPORT FOR THE PIPE SO THAT THE MAXIMUM DEFLECTION DOES NOT EXCEED 5% OF THE PIPE'S ORIGINAL INTERNAL DIAMETER.
- 2. ALL CA-6 MATERIAL TO BE IDOT APPROVED.

SANITARY SEWER AND SERVICES

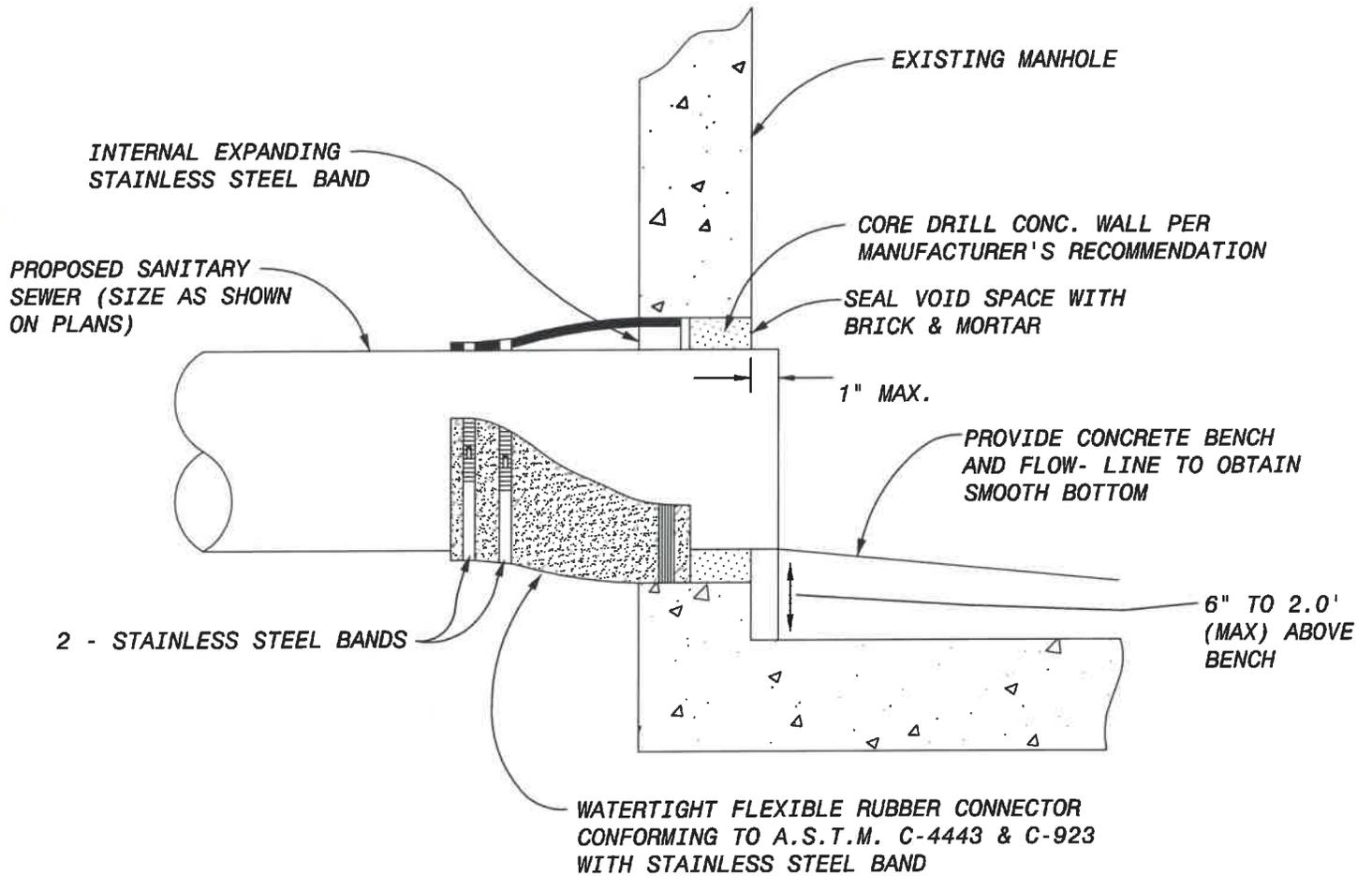


VILLAGE OF MUNDELEIN
ENGINEERING DETAILS

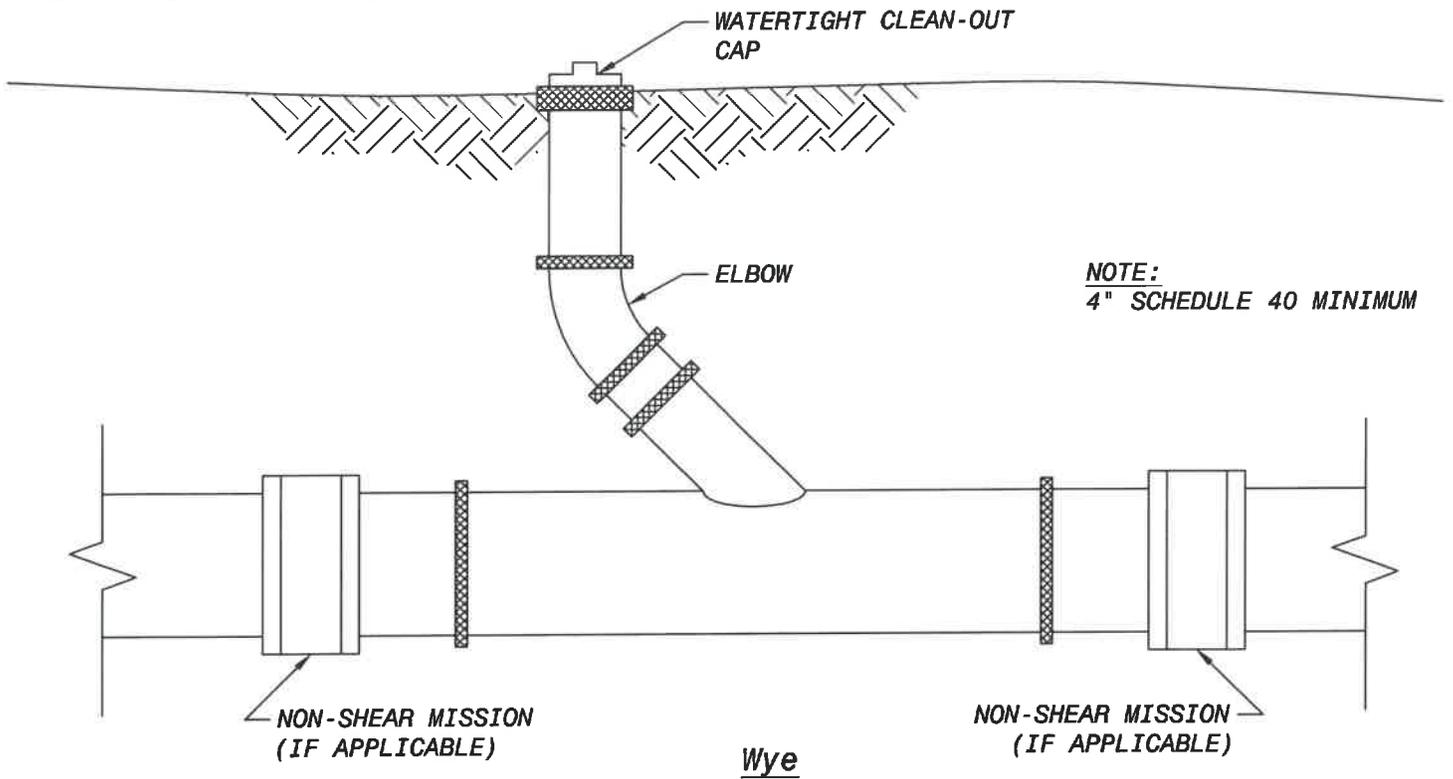
TYPICAL SANITARY TRENCH
CROSS SECTION

REVISIONS				REVISIONS			
REV.	BY	DATE:	REVISION:	REV.	BY	DATE:	REVISION:
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2.	JRB	01-01-19	APPROVED	5.			
3.				6.			

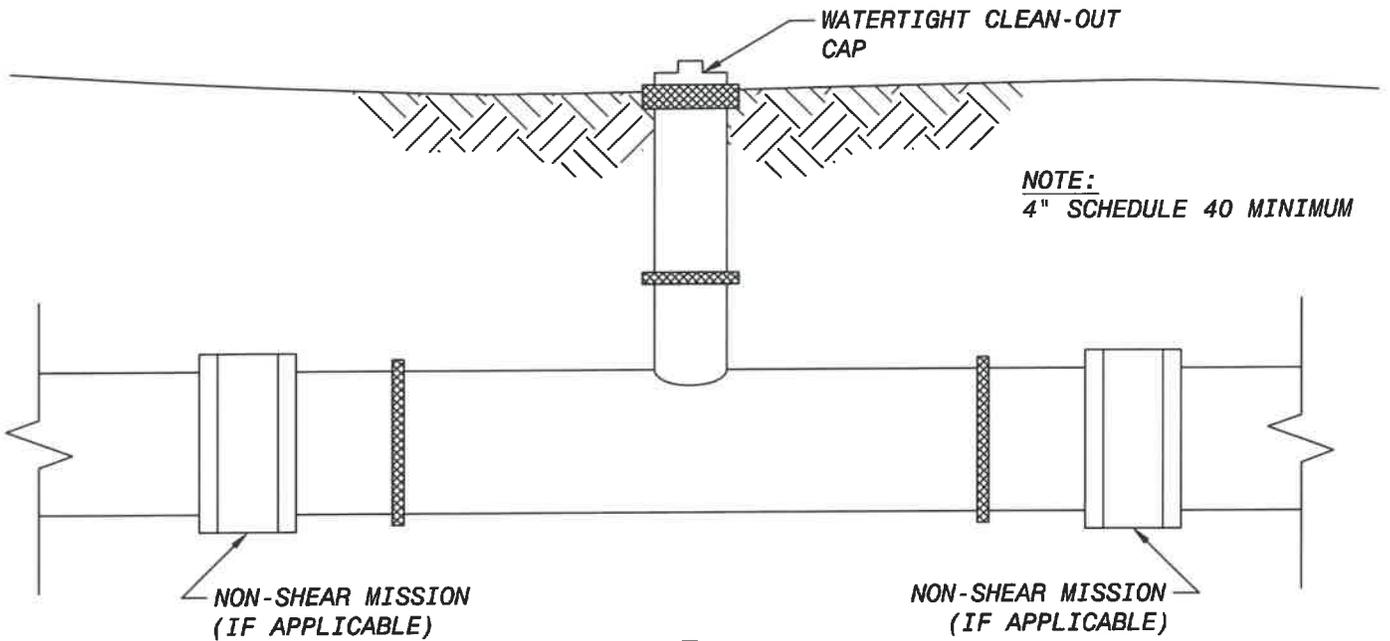
DETAIL NO.
SAN-8



REVISIONS				REVISIONS			
REV.	BY	DATE	REVISION	REV.	BY	DATE	REVISION
1.	MDJ	04-04-05	APPROVED	4.			
2.	JRB	04-14-15	APPROVED	5.			
3.	JRB	01-01-19	APPROVED	6.			

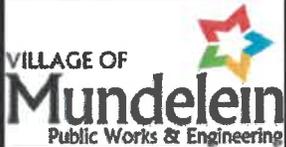


Wye



Tee

NOTE:
 EXTERIOR CLEAN-OUTS CANNOT BE INSTALLED FURTHER THAN 5 FEET FROM THE FOUNDATION.
 EXCEPTION: WHEN EXISTING CONDITIONS PREVENT THE INSTALLATION AS SPECIFIED, THE
 CLEAN-OUT MAY BE INSTALLED IN A LOCATION AS DETERMINED BY THE DIRECTOR OF PUBLIC WORKS.



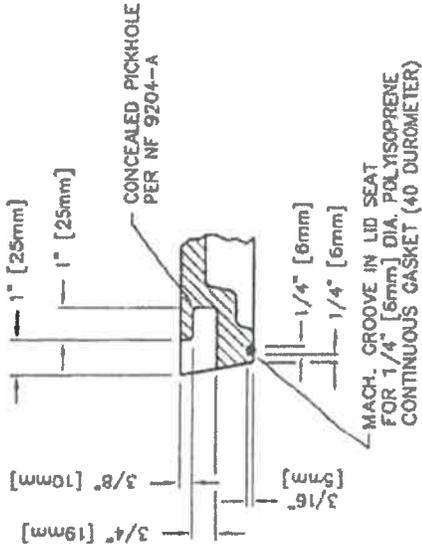
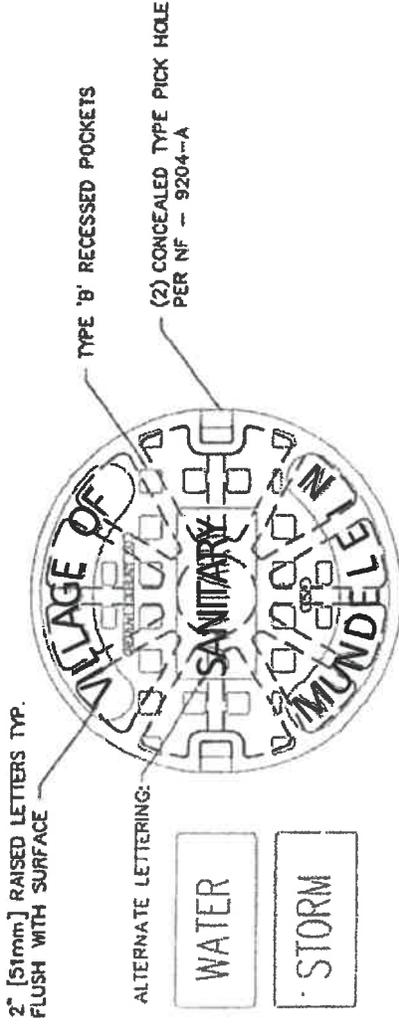
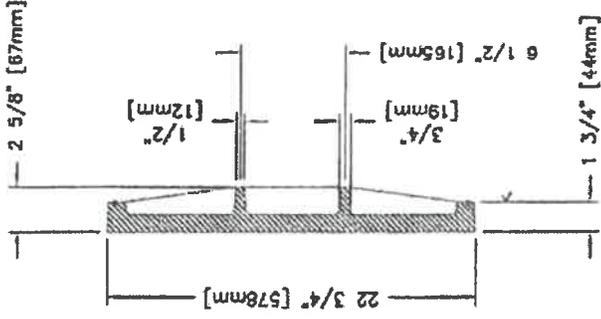
VILLAGE OF MUNDELEIN
 ENGINEERING DETAILS

SANITARY SEWER SERVICE
 CLEANOUT DETAIL

REVISIONS			
REV.	BY	DATE	REVISION
1.	MDJ	04-04-05	APPROVED
2.	JRB	01-01-19	APPROVED
3.			

REVISIONS			
REV.	BY	DATE	REVISION
4.			
5.			
6.			

DETAIL NO.
SAN-10



SELF-SEAL/CONCEALED PICKHOLE DETAIL
QUARTER SCALE

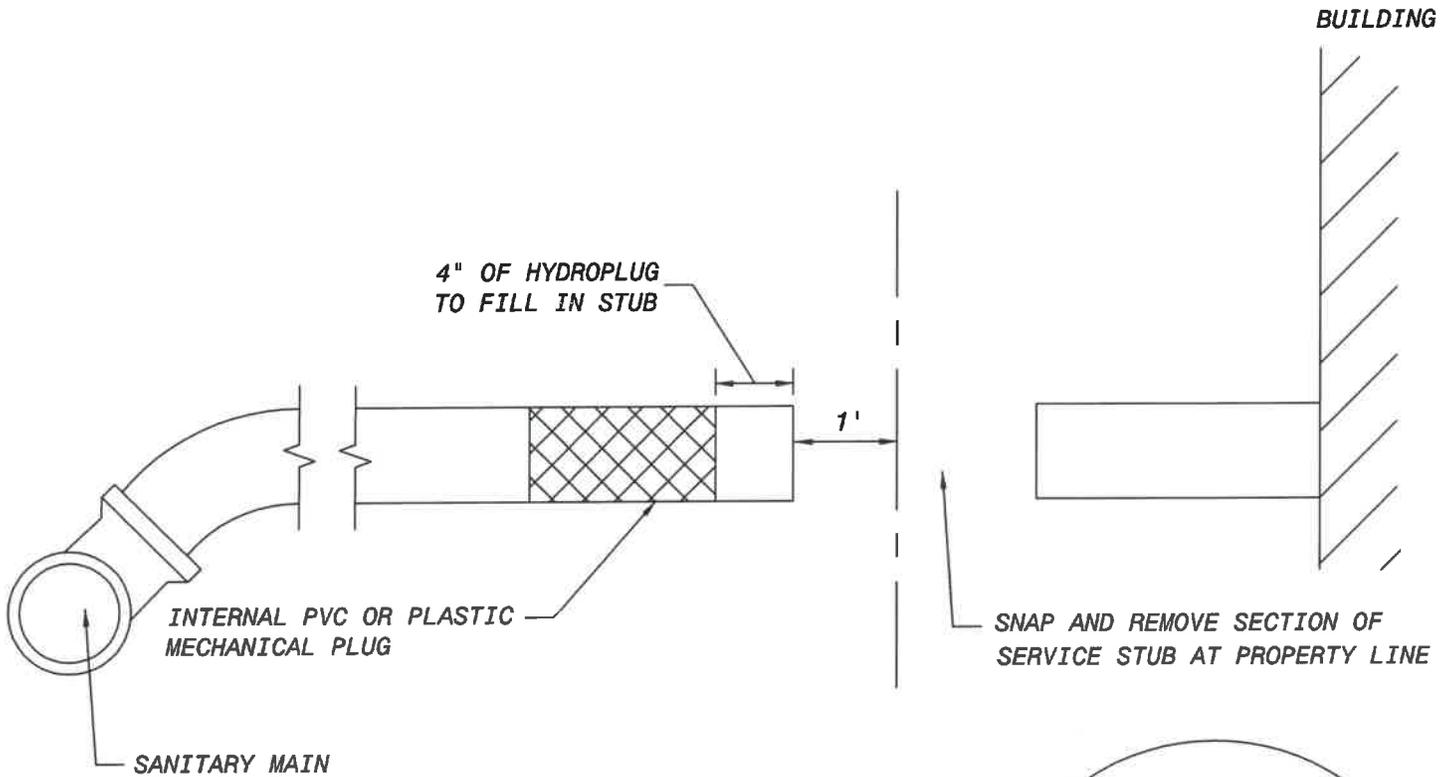
SANITARY MANHOLE SELF SEALING LID

DETAIL NO.
SAN-11

VILLAGE OF MUNDELEIN
ENGINEERING DETAILS



REVISIONS		REVISIONS	
REV.	DATE	REV.	DATE
1.	JRD 01-01-19	4.	
2.		5.	
3.		6.	



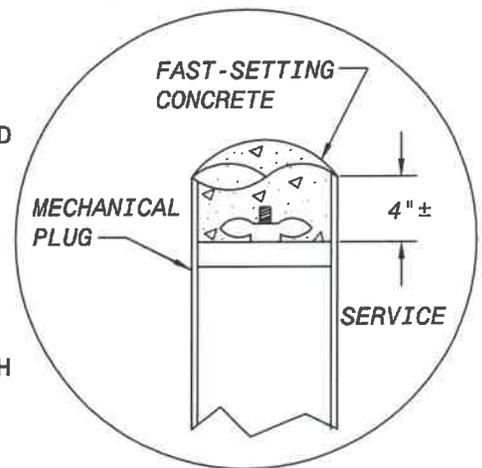
RE-CONSTRUCTION

-- EXISTING STUBS OR SERVICES PLANNED FOR USE MUST BE TELEVIEWED AND VERIFIED BY THE VILLAGE OF MUNDELEIN TO BE IN ACCEPTABLE CONDITION PRIOR TO USE OR REUSE. BREAK IN CONNECTIONS ARE NOT PERMITTED.

RECONSTRUCTING - CONNECT NEW PVC PIPE TO A 1' LENGTH OF EXISTING PIPE USING A NON-SHEAR COUPLING.

IF THE EXISTING TEE IS NOT ACCEPTABLE, THE MAINLINE SEWER SHALL BE CUT AND A WYE SECTION WITH CHAMFER SHALL BE INSTALLED WITH NON-SHEAR MISSION COUPLINGS PLACED OVER CONNECTION POINTS. FOR CLAY PIPE, A MINIMUM OF TWO (2) FEET OF PVC IS REQUIRED ON EACH SIDE OF WYE.

FOR A MAIN THAT HAS BEEN LINED, AN INSERT-A-TEE BRAND FITTING CAN BE USED OVER EXISTING CONNECTION SPOT.



NOTES:

1. ALL SANITARY SEWER SERVICE DISCONNECTS SHALL BE OBSERVED BY A VILLAGE OF MUNDELEIN WASTEWATER DIVISION REPRESENTATIVE.

2. PROVIDE TO THE VILLAGE, A DRAWING WITH MEASUREMENTS FROM 2 STATIONARY OBJECTS INDICATING THE DISCONNECTED SANITARY SEWER SERVICE STUB LOCATION.



VILLAGE OF MUNDELEIN
ENGINEERING DETAILS

SANITARY SEWER
DISCONNECTION DETAIL

REVISIONS			
REV.	BY	DATE	REVISION
1.	MDJ	04-04-05	APPROVED
2.	PW	12-10-10	
3.	JRB	01-01-18	APPROVED

REVISIONS			
REV.	BY	DATE	REVISION
4.			
5.			
6.			

DETAIL NO.
SAN-13

Sanitary Sewer Testing Specifications

A. Testing and Inspection for Acceptance of Sanitary Sewers

Testing and inspection of sanitary sewers for acceptability shall be conducted by the developers and results submitted to Village of Mundelein for approval.

1. Exfiltration of air under pressure.
2. Deflection of flexible Thermoplastic Pipe.
3. Televising.

The method(s) of testing shall be specified in the Special Provisions or on the plans.

B. Testing Technique

All Testing Methods: All wyes, tees, and stubs shall be plugged with flexible jointed caps, or acceptable alternate, securely fastened to withstand the internal test pressure. Such plugs or caps shall be readily removable.

1. Air Testing Method Procedures: The section of sewer to be tested shall have been trench backfilled and cleared. Pneumatic plugs (having a sealing length equal to or greater than the diameter of the pipe to be tested) placed in both ends of the pipe to be tested shall be inflated to 25 psig. The sealed sewer pipe shall then be pressurized to four (4) psig above the average back pressure of groundwater over the sewer pipe and the air pressure allowed to stabilize for at least two (2) minutes.

After the stabilization period the line shall be pressurized to three and a half (3.5) psig and the time in minutes measured for pressure to drop to two and a half (2.5) psig. If groundwater is present, the air pressure within shall be increased to three and a half (3.5) psig above the level of the groundwater and the drop of one (1) pound of air pressure measured in minutes.

Air testing techniques shall be in accordance with the latest ASTM Standard Practice for testing sewer lines by low-pressure air test method for the appropriate pipe material, except that the time shall not be less than that shown in the Air Test Table contained in Section 31-1.11 C of the Standard Specifications for Water and Sewer Main Construction.

2. Deflection Testing for Flexible Thermoplastic Pipe:

- a. The pipeline shall be tested for excess deflection by pulling a "go/no go" mandrel through the pipe from manhole to manhole. The mandrel shall be sized in accordance with Section 31-1.11 C (4) and as specified in the Special Provisions. A "deflectometer" may also be used to check and record deflection.
- b. Wherever possible and practical, the testing shall initiate at the downstream lines and proceed towards the upstream lines.
- c. Where deflection is found to be in excess of allowable testing limits, the Contractor shall excavate to the point of excess deflection and carefully compact around the point where excess deflection was found. The line shall then be retested for deflection. However, should after the initial testing the deflected pipe fail to return to the original size (inside diameter), the line shall be replaced.

3. Televising Standards

- a. The main sanitary sewer shall be televised prior to acceptance. A videotape, CD, or DVD (along with a paper report) shall be submitted to the Village of Mundelein Engineering Department. The paper reports shall include the following: Date, time, street name, manhole numbers from and to, manhole

depths, pipe size, pipe type, direction televised, surface conditions, clock position of services, final distances in feet, and observation details with footage. (Include still photos for each observation that is indicated.) The contractor without delay shall perform all necessary corrective work.

AIR TEST TABLE

SPECIFICATION TIME (MIN:SEC) REQUIRED FOR PRESSURE CROP FROM 30 TO 20 PSIG WHEN TESTING ONE PIPE DIAMETER ONLY

PIPE DIAMETER, Inches

Length of Sewer Pipe in Inches	4	6	8	10	12	15	18	21	24
25	0:04	0:10	0:18	0:28	0:40	1:02	1:29	2:01	2:38
50	0:09	0:20	0:35	0:55	1:19	2:04	2:58	4:03	5:17
75	0:13	0:30	0:53	1:23	1:59	3:06	4:27	6:04	7:55
100	0:18	0:40	1:10	1:50	2:38	4:08	5:56	8:05	10:34
125	0:22	0:50	1:28	2:18	3:18	5:09	7:26	9:55	11:20
150	0:26	0:59	1:46	2:45	3:58	6:11	8:30		
175	0:31	1:09	2:03	3:13	4:37	7:05			
200	0:35	1:19	2:21	3:40	5:17				12:06
225	0:40	1:29	2:38	4:08	5:40			10:25	13:36
250	0:44	1:39	2:56	4:35			8:31	11:35	15:07
275	0:48	1:49	3:14	4:43			9:21	12:44	16:38
300	0:53	1:59	3:31				10:12	13:53	18:09
350	1:02	2:19	3:47			8:16	11:54	16:12	21:10
400	1:10	2:38			6:30	9:27	13:36	18:31	24:12
450	1:19	2:50			6:48	10:38	15:19	20:50	27:13
500	1:28			5:14	7:34	11:49	17:01	23:09	30:14

9" HEAVY DUTY FRAME NEENAH CATALOG NO.
R-1713 OR R-1772 MANHOLE FRAME, W/ TYPE G
STANDARD FLAT GRATE

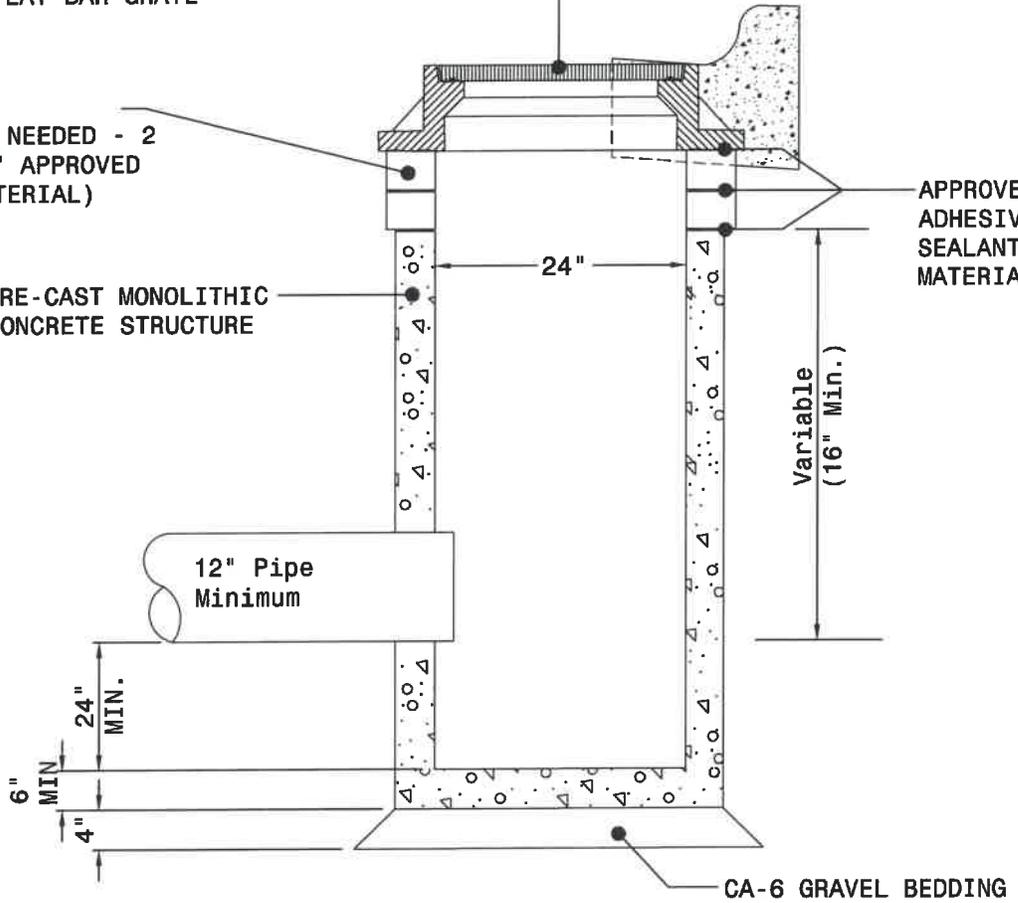
OR

EAST JORDAN IRON WORKS CATALOG NO. 1022
FRAME W/ TYPE M2 FLAT BAR GRATE

CRETEX PRO-RING™
ADJUSTING RINGS (IF NEEDED - 2
MAX. ALLOWED, MAX 8" APPROVED
ADHESIVE/SEALANT MATERIAL)

PRE-CAST MONOLITHIC
CONCRETE STRUCTURE

APPROVED
ADHESIVE/
SEALANT
MATERIAL



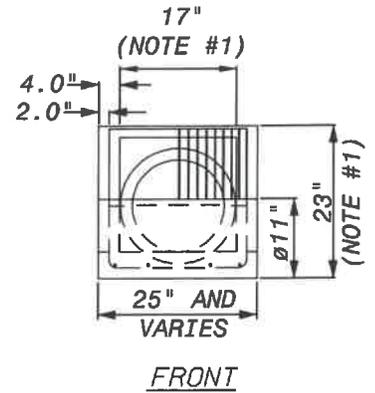
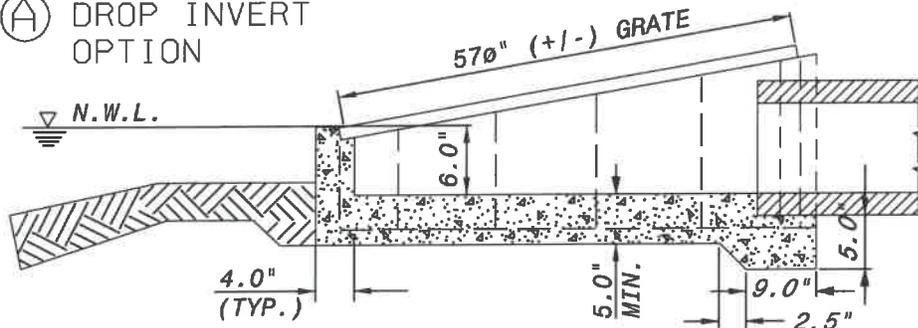
VILLAGE OF MUNDELEIN
ENGINEERING DETAILS

CURB INLET

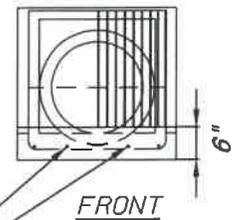
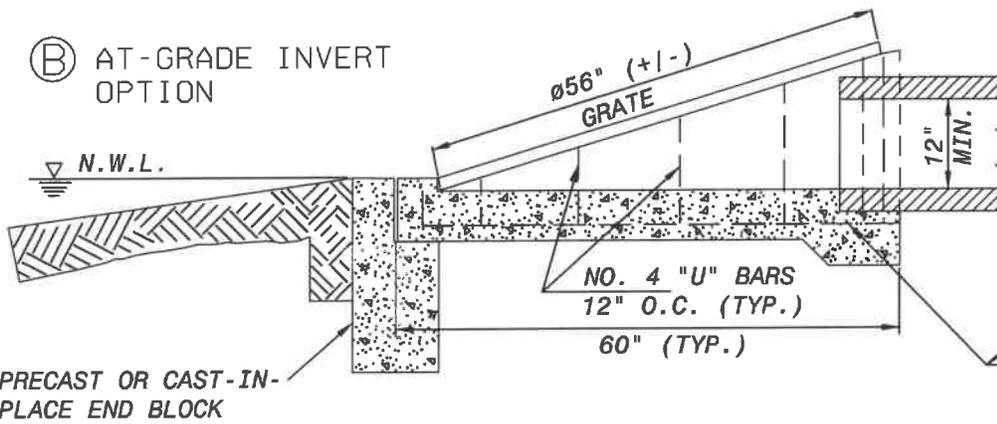
REVISIONS				REVISIONS			
REV.	BY	DATE	REVISION	REV.	BY	DATE	REVISION
1.	MDJ	04-04-05	APPROVED	4.			
2.	JRB	01-01-19	APPROVED	5.			
3.				6.			

DETAIL NO.
ST-1

(A) DROP INVERT OPTION

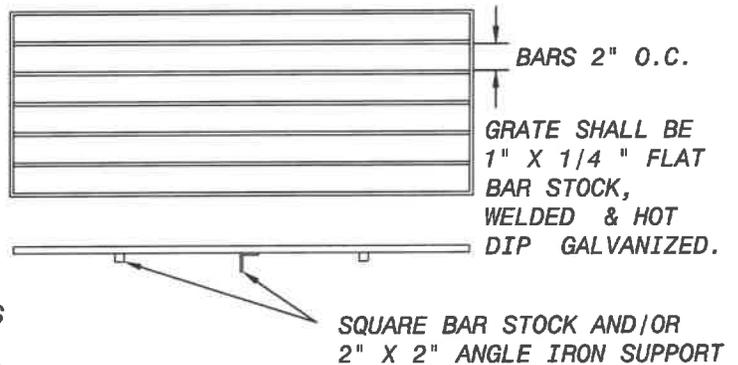


(B) AT-GRADE INVERT OPTION

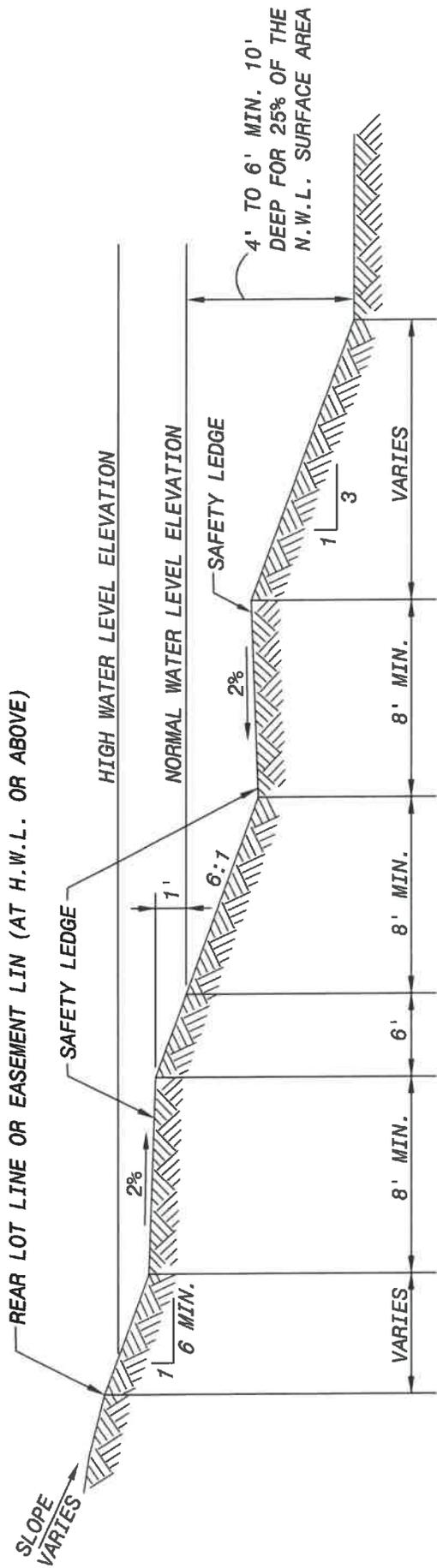


NOTES:

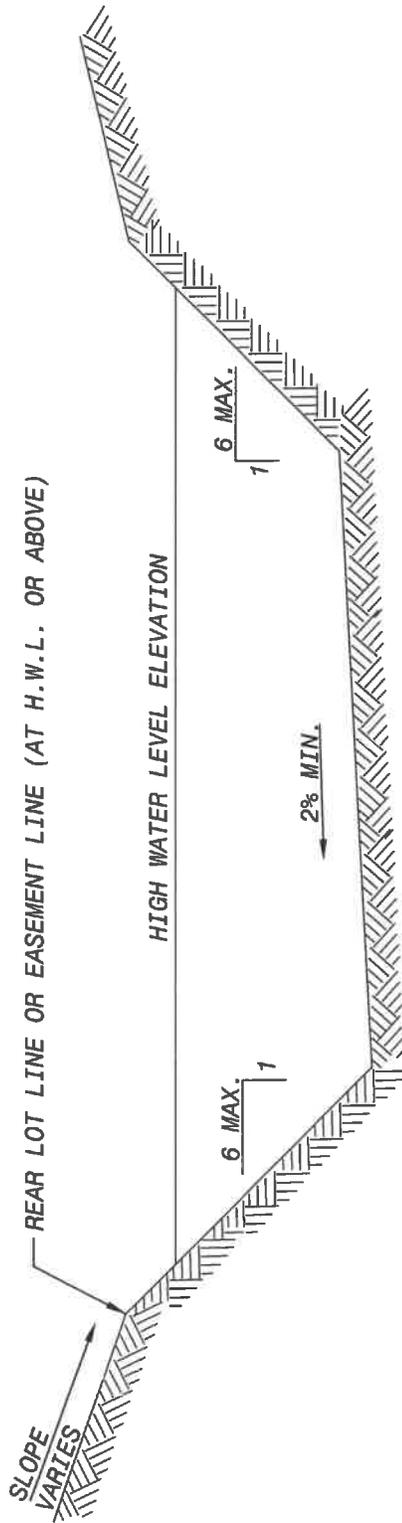
1. DIMENSION FOR MINIMUM 12" STANDARD OUTLET. LARGER OUTLET PIPES REQUIRE CUSTOM DESIGN.
2. ALL CONCRETE SHALL BE IDOT CLASS PC PER ARTICLES 504 AND 1020.
3. REINFORCE SIMILAR TO IDOT STD 542501 AND 542506.
4. FASTEN BAR GRATE WITH 2½" x ⅜" LAG BOLTS WITH MASONRY ANCHORS.
5. FIELD MEASURE OPENING FOR GRATE PRIOR TO FABRICATION.
6. FRONT WALL OF DROP INVERT MAY BE MODIFIED FOR INSTALLATION OF AN ORIFICE ONLY WITH ENGINEERS APPROVAL.
7. SUBMIT SHOP DRAWING FOR VILLAGE APPROVAL PRIOR TO INSTALLATION.



REVISIONS				REVISIONS			
REV.	BY	DATE	REVISION:	REV.	BY	DATE	REVISION:
1.	MDJ	04-04-05	APPROVED	4.			
2.	JRB	01-01-19	APPROVED	5.			
3.				6.			



TYPICAL DETENTION POND CROSS-SECTION - WET BASIN
 (NOT APPLICABLE FOR DRY BOTTOM DET-BASINS OR WETLANDS)



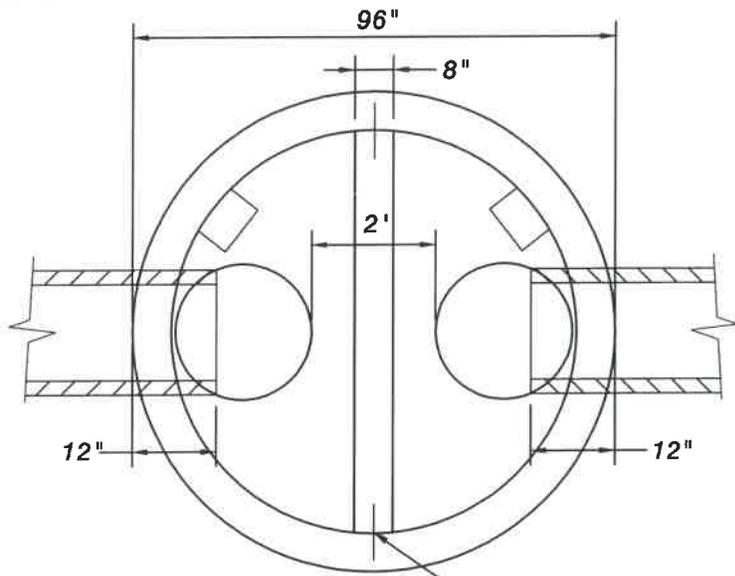
TYPICAL DETENTION POND CROSS-SECTION - DRY BASIN
 (NOT APPLICABLE FOR WET BOTTOM DET-BASINS OR WETLANDS)

VILLAGE OF MUNDELEIN
 ENGINEERING DETAILS



REVISIONS		REVISIONS	
REV.	DATE	BY	DATE
1.	04-04-05	MOU	APPROVED
2.	01-01-19	JRB	APPROVED
3.			
4.			
5.			
6.			

TYPICAL DETENTION POND
 CROSS-SECTION



#5 EPOXY COATED DOWELS
DRILL & GROUT @ 16" O.C.

TWIN NEENAH R-1700-A
FRAMES & LIDS
IMPRINTED "VILLAGE OF
MUNDELEIN" & "STORM"

RIM ELE. = _____

INTERNAL SPILLWAY
@ 100 YR H.W.L.
ELEV. = _____

100 YR EVENT
INV ELE. = _____
DIAMETER _____

96" MIN. PRECAST
CONCRETE CATCH BASIN
WITH 8" REINFORCED
CONCRETE BAFFLE WALL

STEPS @ 16" O.C.
BOTH SIDES

#5 EPOXY COATED BARS @ 8"
O.C. VERT & HORIZONTAL

INLET

OUTLET

2 YR EVENT
INV ELE. = _____
DIAMETER _____

4" COMPACTED
CA-6

SUMP
18" MIN.

UNDISTURBED EARTH



VILLAGE OF MUNDELEIN
ENGINEERING DETAILS

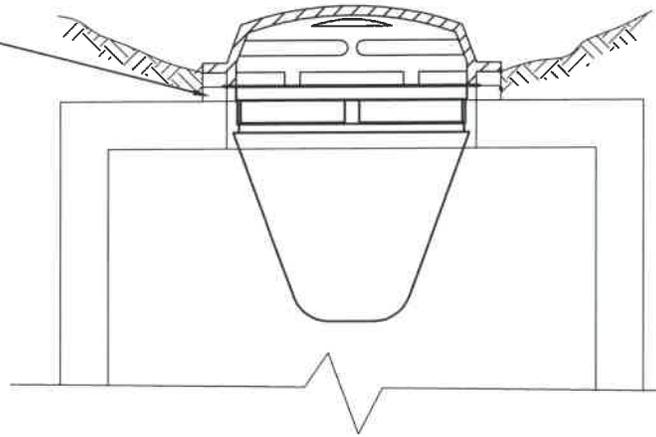
RESTRICTOR STRUCTURE

REVISIONS				REVISIONS			
REV.	BY	DATE	REVISION	REV.	BY	DATE	REVISION
1.	MDJ	04-04-05	APPROVED	4.			
2.	JRB	01-01-19	APPROVED	5.			
3.				6.			

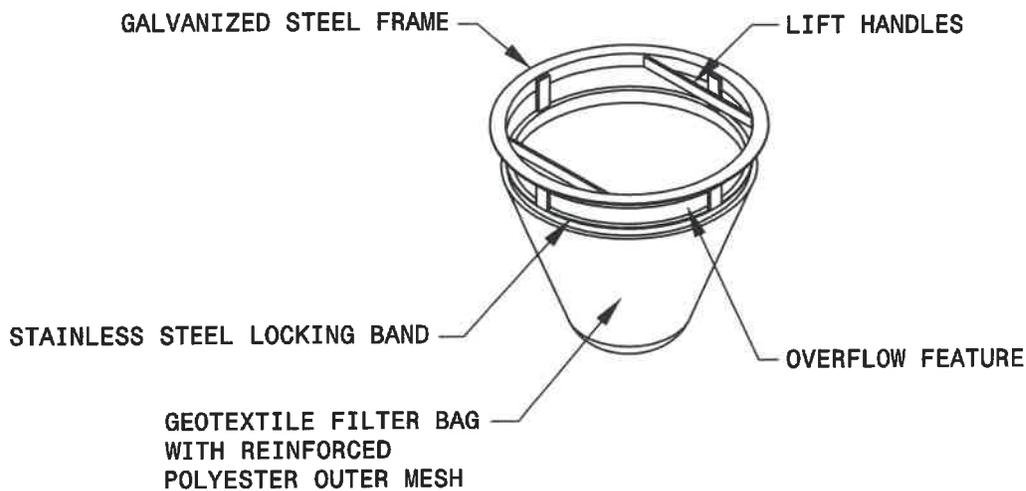
DETAIL NO.

ST-4

MANHOLE
ADJUSTING
RINGS



SECTION THROUGH MANHOLE



FILTER INSERT

REVISIONS			
REV.	BY	DATE	REVISION
1.	MDJ	04-04-05	APPROVED
2.	JRB	01-01-19	APPROVED
3.			

REVISIONS			
REV.	BY	DATE	REVISION
4.			
5.			
6.			

TYPICAL REAR YARD INLET BEEHIVE NEENAH R-4340 B

**R-4340 Series
Round Beehive Grates**

Light Duty—For Ditch Drainage Construction

May be used in vitrified clay pipe bell, on a concrete catch basin, or in a cast iron frame as shown below. Effective where debris may interfere with drainage, such as at a roadside or in a median strip.

Bell and spigot vitrified clay and concrete pipe are made under many specifications and dimensions vary. Check the grate sizes in the table to be sure they will fit the pipe you are using.

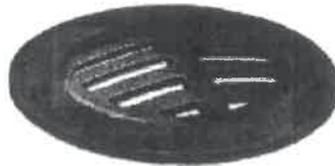
Specify:

1. Catalog number.
2. Cast iron frame if required.

Catalog No.	Dimensions in Inches							
	O Dia.	O.D. Lugs	Dia. Bhv	Ht Bhv	No. Lugs	Size Bars	Size Op.	Pipe Size
R-4340-A	34	26 1/4	23 7/8	6	6	1	1 1/2	24
* R-4340-B	33	23	23	3	6	1 1/2	2	24
R-4340-C	33	29	23	5 3/4	4	1 1/4	1	24
R-4340-F	33	28	25	5	4	1	1	24
R-4340-F1**	25 1/2	21 3/4	17	3	4	1	1	18
R-4340-G**	28	18	18	3	3	2	1 3/4	16
R-4340-H	25	15	17	3	3	1 3/4	1 5/8	12

*Furnished with ring instead of lugs.

**Do not have frame available.

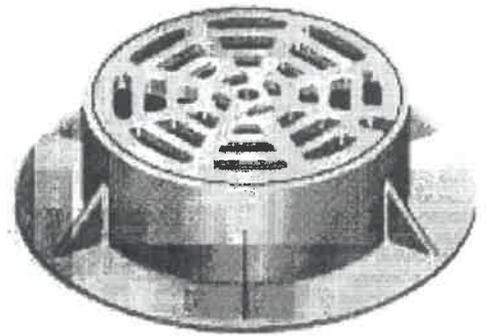
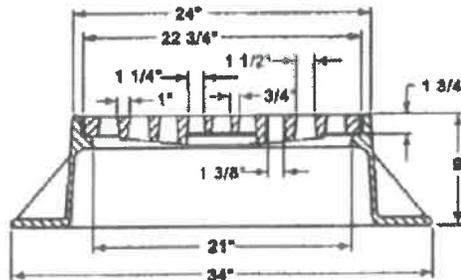


Illustrating R-4340-B

ALTERNATE REAR YARD INLET BEEHIVE NEENAH R-2504
TO BE USED ONLY IN AREAS WITH SMALL DRAINAGE TRIBUTARY AREAS (LOW SPOTS, SHORT SWALES, ETC.) APPROVAL REQUIRED BY VILLAGE ENGINEER.

**R-2504
Catch Basin Frame and Grate**

Heavy Duty



Uses R-1713 frame.

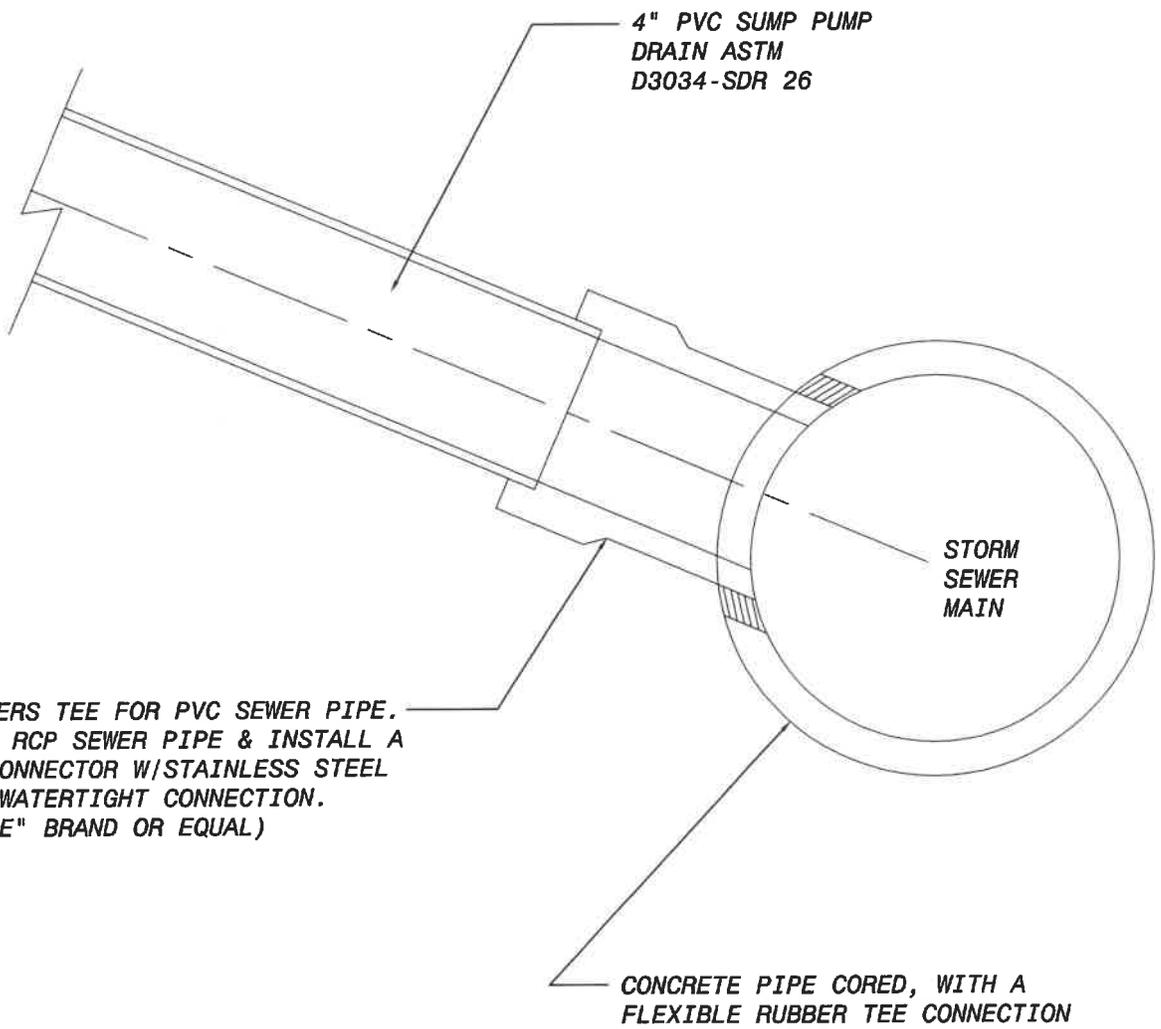


VILLAGE OF MUNDELEIN
ENGINEERING DETAILS

TYPICAL REAR YARD INLETS

REVISIONS				REVISIONS			
REV.	BY	DATE:	REVISION:	REV.	BY	DATE:	REVISION:
1.	MDJ	04-04-05	APPROVED	4.			
2.	JRB	01-01-19	APPROVED	5.			
3.				6.			

DETAIL NO.
ST-6



1. MANUFACTURERS TEE FOR PVC SEWER PIPE.
2. FIELD CORE RCP SEWER PIPE & INSTALL A FLEXIBLE CONNECTOR W/STAINLESS STEEL BANDS FOR WATERTIGHT CONNECTION. ("KOR-N-TEE" BRAND OR EQUAL)

NOTE:
NOT TO BE INSTALLED UNDER DRIVEWAY OR SIDEWALK



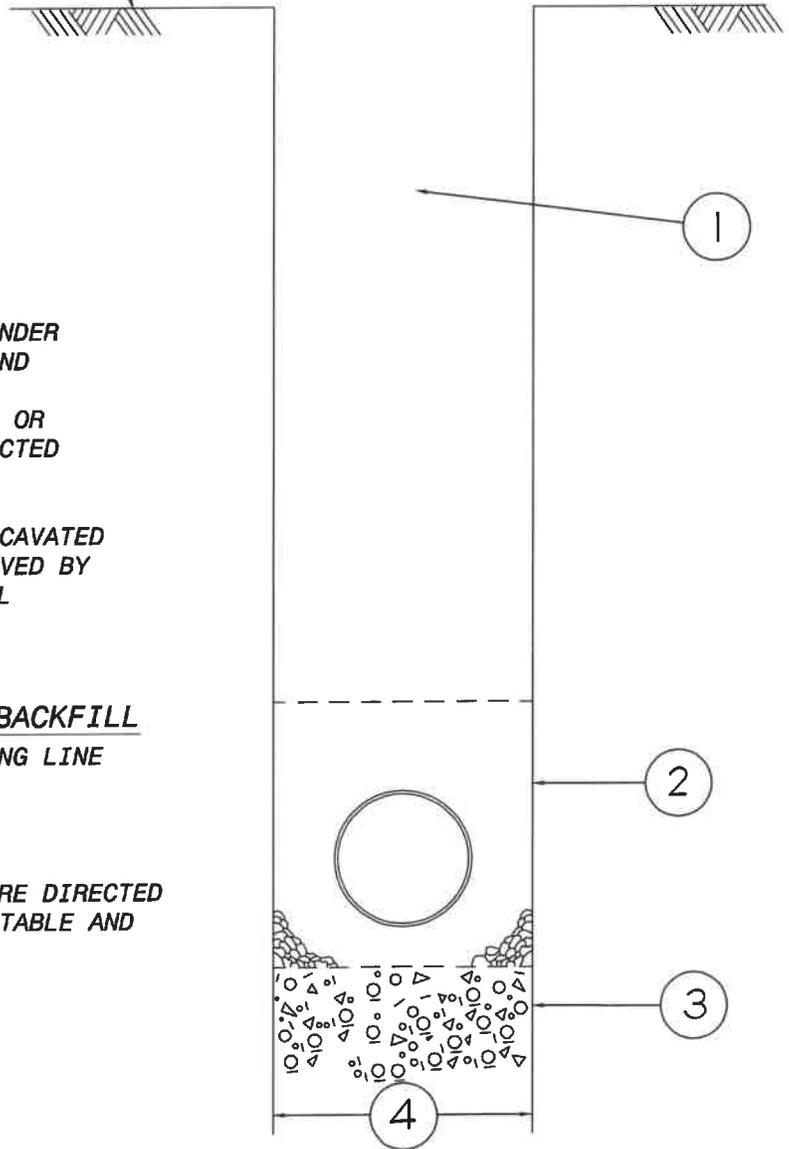
VILLAGE OF MUNDELEIN
ENGINEERING DETAILS

SUMP PUMP CONNECTION
TO STORM SEWER

REVISIONS				REVISIONS			
REV.	BY	DATE	REVISION	REV.	BY	DATE	REVISION
1.	MDJ	04-04-05	APPROVED	4.			
2.	JRB	01-01-19	APPROVED	5.			
3.				6.			

DETAIL NO.
ST-7

FINISHED GRADE



① SELECT TRENCH BACKFILL

GRANULAR TRENCH BACKFILL TO BE USED UNDER EXISTING OR PROPOSED PAVEMENT, CURB AND GUTTER, SIDEWALK OR WITHIN 2' OF ANY EXISTING/ OR PROPOSED CURB AND GUTTER OR SIDEWALK, SHALL BE MECHANICALLY COMPACTED CA-6, CRUSHED CONCRETE OR GRADE #9

MECHANICALLY COMPACTED BACKFILL OF EXCAVATED MATERIALS IN OTHER LOCATIONS IF APPROVED BY THE ENGINEER. REFER TO TRENCH BACKFILL SPECIAL PROVISIONS FOR MATERIALS AND COMPACTION REQUIREMENTS.

② PIPE BEDDING & INITIAL TRENCH BACKFILL

#6 WASHED STONE FROM 6" BELOW TO SPRING LINE OF PIPE.

③ UNSUITABLE MATERIALS

IF ENCOUNTERED - SHALL BE REMOVED WHERE DIRECTED BY THE ENGINEER AND REPLACED WITH SUITABLE AND COMPACTED MATERIAL

④ TRENCH WIDTH

MINIMUM = PIPE O.D. + 12"
MAXIMUM = PIPE O.D. + 18"

NOTES:

1. ALL CA-6 MATERIAL TO BE IDOT APPROVED.

REVISIONS				REVISIONS			
REV.	BY	DATE	REVISION	REV.	BY	DATE	REVISION
1.	MDJ	04-04-05	APPROVED	4.			
2.	JRB	01-01-19	APPROVED	5.			
3.				6.			

Miscellaneous Water Main Notes

Water Main

A. Water Main Pipe Materials

1. PVC SDR 18 AWWA C-909 PVC Pipe (12" Diameter and smaller) or Class 52 Ductile Iron cement lined ANSI/AWWA c104/A21.4 Pipe (16" and larger).
2. Water main pipe must have a minimum of five (5)-feet six (6)-inches cover per the Trench Material Detail.

B. Restrained Joints

1. All mechanical joint fittings are to be restrained with Tyler Union Series 1500 TDW - TUFGRIP. Fittings shall be specifically approved for C-909 PVC Pipe or Class 52 Ductile Iron Pipe respectively.
2. All mechanical joint fittings to be assembled with stainless steel #316 Teflon coated nuts and bolts.
3. All mechanical joint fittings must contain minimum of three (3) zinc anode (6 ounce minimum) caps attached to every other bolt of each fitting (see detail).
4. All Fittings must indicate "Made in the U.S.A."

C. Tracer Wire

1. Tracer wire Copperhead Soloshot™ 12 AWG high strength copper clad steel conductor (HS-CCS), insulated with a 45-mil high density, high molecular weight polyethylene jacket and rated for direct burial use at 30 volts.
2. Tracer wire must be secured to the top of water main pipe at intervals not to exceed four (4)-feet with plastic zip ties of appropriate length.
3. Tracer connectors shall be DryConn® 3-Way Direct Bury Lug Plus connector and must be brought to the bottom of frame and secured in valve vaults.
4. Fire hydrants shall include Cobra T3 Test Stations (Red) to be installed as shown on the plan details.
5. Tracer wire must be secured to the top of valve vaults (per detail.)

Fire Hydrants

A. Materials

1. The Fire Hydrant must be Mueller Super Centurion 250, A-423 Model. Must include attached valve and locking tee.
2. The below grade nuts & bolts on the hydrant must be #316 stainless steel installed from the manufacturer.
3. Water main "spool" pieces of pipe between the branch tee and the hydrant shoe must be a swival x solid adaptor with swival gland made of Ductile Iron. Spool piece must indicate "Made in the USA" .
4. Fire hydrant tees must be installed in a horizontal position to the water main. Hydrant auxiliary valve of excessive depth must have an extension on the valve nut to permit clear operation above the hydrant.
5. Fire hydrants must be installed so that the "Bury Line Indicator" is at final grade. Contractor is responsible for verification of bury depth.
6. Fire Hydrants must indicate "Made in the U.S.A." and be stamped with the current calendar year.

B. Spacing and Location

1. Fire hydrants shall be installed along all water mains constructed in public right-of-way, at a maximum spacing of 350-feet. However, fire hydrants must be installed on lot lines in single-family residential installations.
2. Fire hydrants must be at least 20-feet from any intersection.

3. Hydrants shall be installed no closer than three (3)-feet to the back of curb (unless approved by the Water Superintendent) from the steamer port (pumper nozzle), nor further than eight (8)-feet from the back curb. No hydrant shall be installed within 48-inches of any obstruction, nor shall any obstruction be placed within 48-inches of an existing hydrant. A minimum five (5)-foot distance from any driveway entrance must be maintained.
4. Bury depth of hydrant needs to be equivalent of profile grade line on hydrant. It must also meet the final grade of ground. Field adjustments must also include fire hydrant bury depth.

C. Distance

Fire Department review required for distance from building.

D. Paintings

1. All hydrants shall be "Safety Red."

Valves

A. Materials

1. All water valves must be Mueller Brand A-2362 with 316 stainless steel bolts.
2. All valves must indicate "Made in the USA" and be manufactured/stamped with the current calendar year.

B. Spacing and Location

1. Water main valves shall be spaced at a minimum of 400-feet, or at a distance such that in the event of a required shut down of the public main, no more than 24 single family residential units shall be out of water service, whichever results in the shortest valve spacing or as approved by the Public Works Department. Valve vaults shall not be allowed within driveways or sidewalks.

Connection to Existing Mains

All connections to the Village water distribution system shall be made under full water service pressure in accordance with Village Engineering Design Details or as required.

A. Materials

1. **When connection is size on size piping, a two (2) piece Ductile Iron Sleeve is required (Made in the USA).**
2. When branch size is smaller than existing pipe, a stainless steel tapping sleeve will be used.
3. All tapping sleeves must be air tested prior to tapping water main.

Water Service Lines (Two (2)-Inches and Smaller)

A. Materials

1. A water service line is designed to deliver water from a public water distribution main from the main to a single building, and includes corporation stop, curb stop, and service box. Service lines shall be Type K copper and installed approximately at a right angle to the centerline of the right-of-way. Service lines shall be continuous with no splices between either the corporation and the curb stop or the curb stop and the water meter.
2. The water service tap will include a full circle stainless steel tapping sleeve.
3. All fittings will consist of a flare by flare connection or a compression by compression connection.
4. Contractor/developer must complete all work related to the service line.

B. Spacing and Location

Service connections must maintain a three (3)-foot separation from any other service connection, pipe bell or fitting, valve vault, and/or fire hydrant.

C. Inspections Required

1. The Village of Mundelein Water Superintendent or their designate must witness the tap/connection to water main. For taps on PVC water main, a coupon from the tap must be provided to the inspector. Minimum 24 hour advance notice is required.
2. The Village of Mundelein Plumbing Inspector or his designate must inspect the service line from the corporation stop to the curb stop. Minimum 24 hour advance notice is required.
3. The Village of Mundelein Plumbing Inspector or his designee must inspect the service line from the curb stop to the water meter. Minimum 24 hour advance notice is required.

D. Special Notes

1. The water service line inside of building must have a minimum of 12 inches of Type K copper prior to the first fitting. The water meter must be set within 18-inches after entering the building.
2. The water service must enter the front side of a single family residential building upon which it services.

Water Service/Fire Lines (Larger Than Two (2)-Inches)

Water services that are larger than two (2)-inch Type K copper services shall be a minimum size of four (4)-inch water main pipe. (Three (3)-inch piping is not permitted.) These water services can be a combination system for both domestic use and fire protection.

A. Materials

Water service lines larger than two (2)-inches must follow all the materials, procedures, policies, and details for water main installations.

B. Fire Protection

Any water service line designated for fire protection must be sized appropriately in order to sufficiently supply water for fire protection based on the fire flow requirement of the building. Documentation must be submitted and approved by the Village of Mundelein Fire Department.

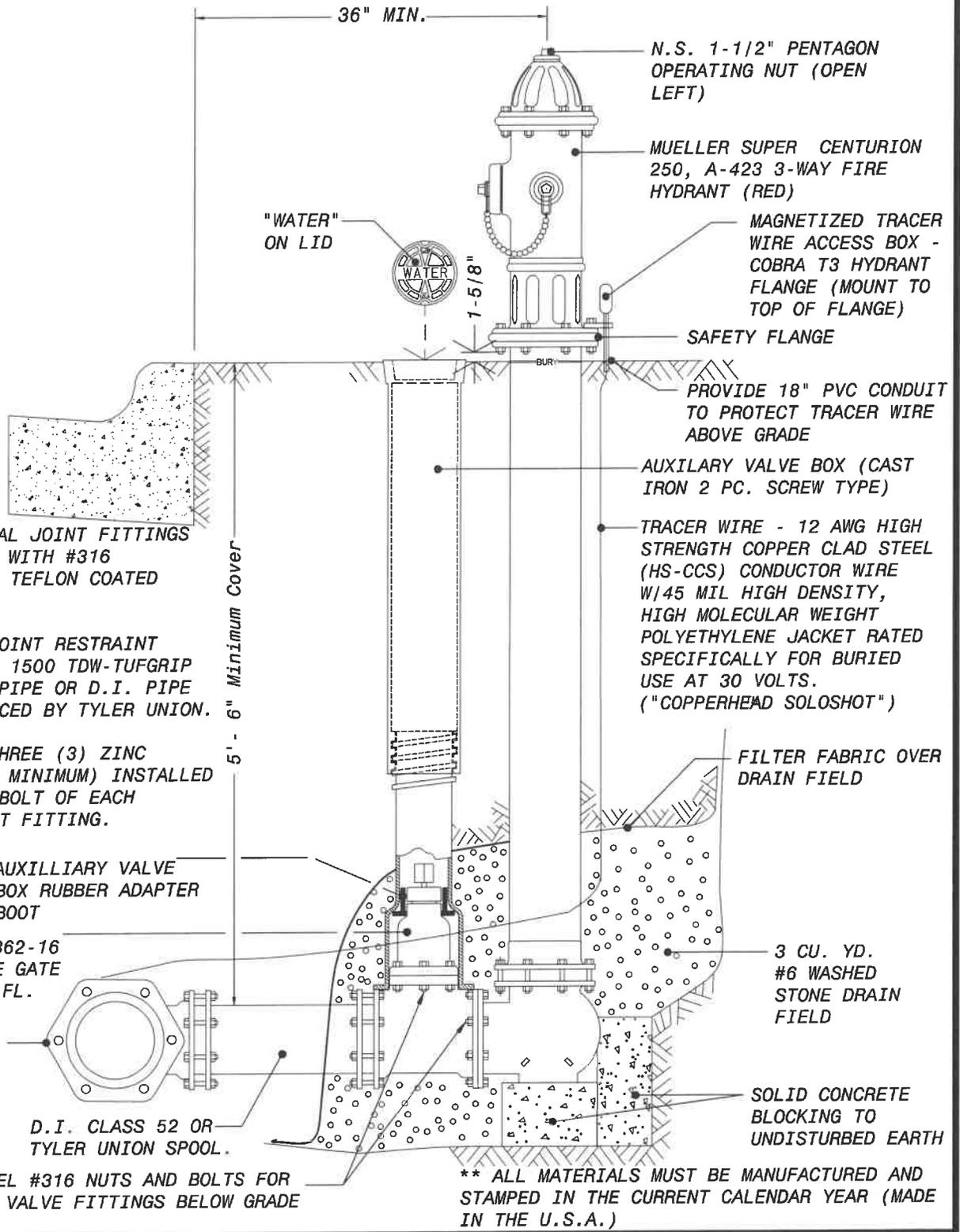
C. Combination Fire/Domestic Usage

Any water service line designated for both fire and domestic usage must meet the following requirements:

1. Water service line must be sized to meet the fire protection requirements and domestic usage of the building.
2. Water service line must enter the building in a designated Meter/Fire Sprinkler Room.
3. Upon entering Meter/Fire Sprinkler Room, the domestic service will branch off from the fire service with valves installed on the fire line and domestic service prior to pressure testing.

D. Inspections and Testing

The inspections and testing of the water service for fire/domestic usage shall follow the guidelines and methods for water main inspections and testing procedures.



NOTE:

- 1) ALL MECHANICAL JOINT FITTINGS TO BE ASSEMBLED WITH #316 STAINLESS STEEL TEFLON COATED NUTS & BOLTS.
- 2) MECHANICAL JOINT RESTRAINT SHALL BE SERIES 1500 TDW-TUFGRIP WITH C-909 PVC PIPE OR D.I. PIPE CLASS 52, PRODUCED BY TYLER UNION.
- 3) MINIMUM OF THREE (3) ZINC ANODES (8 OUNCE MINIMUM) INSTALLED ON EVERY OTHER BOLT OF EACH MECHANICAL JOINT FITTING.

6" MUELLER A-2362-16 RESILIENT WEDGE GATE VALVE - M.J. X FL.

DUCTILE IRON MECHANICAL JOINT TEE

D.I. CLASS 52 OR TYLER UNION SPOOL.

STAINLESS STEEL #316 NUTS AND BOLTS FOR ALL HYDRANT & VALVE FITTINGS BELOW GRADE (TYPICAL)

** ALL MATERIALS MUST BE MANUFACTURED AND STAMPED IN THE CURRENT CALENDAR YEAR (MADE IN THE U.S.A.)



VILLAGE OF MUNDELEIN
ENGINEERING DETAILS

TYPICAL FIRE HYDRANT

REVISIONS				REVISIONS			
REV.	BY	DATE	REVISION:	REV.	BY	DATE	REVISION:
1.	MDJ	04-04-05	APPROVED	4.	JRB	01-01-19	APPROVED
2.	JRB	04-14-15	APPROVED	5.	JRB	07-01-19	PER VILLAGE COMMENTS
3.	JRB	02-27-17	PER WATER DEPARTMENT	6.			

DETAIL NO.
W-1

NEENAH CATALOG NO. R-1713 MANHOLE FRAME, TYPE "B" SELF-SEALING SOLID LID W/ "VILLAGE OF MUNDELEIN" & "WATER" IMPRINT (OR EQUIVALENT EAST JORDAN IRON WORKS FRAME AND LID)

EXPANDED POLYPROPYLENE (CRETEX PRO-RING) ADJUSTING RINGS (IF NEEDED)

MAX. ALLOWABLE ADJUSTMENT UTILIZING RINGS IS 8". IF GREATER ADJUSTMENT IS NEEDED, IT MUST BE ACCOMPLISHED UTILIZING 5' DIA. PRE-CAST BARREL SECTION.

TRACER WIRE - 12 AWG HIGH STRENGTH COPPER CLAD STEEL (HS-CCS) CONDUCTOR WIRE W/45 MIL HIGH DENSITY, HIGH MOLECULAR WEIGHT POLYETHYLENE JACKET RATED SPECIFICALLY FOR BURIED USE AT 30 VOLTS. ("COPPERHEAD SOLOSHOT"™)

MUELLER CATALOG NO. A-2362 RESILIENT WEDGE GATE VALVE M.J. X M.J. (FOR SIZES THRU 12")

TRACER CONNECTORS - DRYCONN® 3-WAY DIRECT BURY LUG PLUS

MECHANICAL JOINT RESTRAINT GLAND

6" GRANULAR BED

SOLID CONCRETE BLOCK

SECURE TRACER WIRE TO TOP OF STRUCTURE W/TAPCON SCREW (1/2" MIN. DIA.)

MANUFACTURER APPROVED SEALANT

STEPS AT 16" O.C. NEENAH R-1980-1

5" MIN.

BITUMINOUS GASKET MATERIAL

C-909 PVC Pipe

STAINLESS STEEL #316 NUTS AND BOLTS FOR ALL FITTINGS BELOW GRADE

5' - 6" MINIMUM BURY

60" MIN.

NOTE:

- 1) ALL MECHANICAL JOINT FITTINGS TO BE ASSEMBLED WITH STAINLESS STEEL TEFLON COATED NUTS AND BOLTS.
- 2) MECHANICAL JOINT RESTRAINT SHALL BE APPROVED FOR USE WITH C-909 PVC PIPE & D.I.P., PRODUCED BY TYLER UNION OR APPROVED EQUAL (MADE IN THE USA).
- 3) MINIMUM OF THREE (3) ZINC ANODES (6 OUNCE MIN) INSTALLED ON EVERY OTHER BOLT OF EACH MECHANICAL JOINT FITTING.
- 4) ALL PARTS MUST BE MANUFACTURED AND STAMPED WITH THE CURRENT CALENDAR YEAR (MADE IN THE U.S.A.)



VILLAGE OF MUNDELEIN
ENGINEERING DETAILS

TYPICAL VALVE VAULT
(5' I.D.)

REVISIONS				REVISIONS			
REV.	BY	DATE:	REVISION:	REV.	BY	DATE:	REVISION:
1.	MDJ	04-04-05	APPROVED	4.	JRB	01-01-19	APPROVED
2.	JRB	04-14-15	APPROVED	5.	JRB	07-01-19	PER VILLAGE COMMENTS
3.	JRB	02-27-17	PER WATER DEPARTMENT	6.			

DETAIL NO.

W-2

NEENAH CATALOG NO. R-1713 MANHOLE FRAME, TYPE "B" SELF-SEALING SOLID LID W/ "VILLAGE OF MUNDELEIN" & "WATER" IMPRINT (OR EQUIVALENT EAST JORDAN IRON WORKS FRAME AND LID.)

SECURE TRACER WIRE TO TOP OF STRUCTURE W/TAPCON SCREW (1/2" MIN. DIA.)

EXPANDED POLYPROPYLENE (CRETEX PRO-RING) ADJUSTING RINGS (IF NEEDED) MAX. ALLOWABLE ADJUSTMENT UTILIZING RINGS IS 8". IF GREATER ADJUSTMENT IS NEEDED, IT MUST BE ACCOMPLISHED UTILIZING 5' DIA. PRE-CAST BARREL SECTION.

MANUFACTURER APPROVED SEALANT

STAINLESS STEEL TAPPING SLEEVE (WHEN BRANCH IS OF LESSER SIZE THAN RUN). D.I.P. TAPPING SLEEVE IS TO BE USED FOR "SIZE-ON-SIZE" PRESSURE TAPS. (MADE IN THE USA)

STEPS AT 16" O.C. NEENAH R-1980-1

TRACER WIRE - 12 AWG HIGH STRENGTH COPPER CLAD STEEL (HS-CCS) CONDUCTOR WIRE W/45 MIL HIGH DENSITY, HIGH MOLECULAR WEIGHT POLYETHYLENE JACKET RATED SPECIFICALLY FOR BURIED USE AT 30 VOLTS. ("COPPERHEAD SOLOSHOT"™)

5" MIN

60" MINIMUM DIAMETER

BITUMINOUS GASKET MATERIAL

MUELLER A-2362 RESILIENT WEDGE TAPPING VALVE M.J. X FL ENDS

C-909 PVC Pipe

Mechanical Joint Restraint Gland

6" SPLIT CONCRETE BASE

6" GRANULAR BED

SOLID CONCRETE BLOCK

NOTE:

- 1) 72" VAULT WHEN PRESSURE CONNECTION IS LARGER THAN 10"
- 2) ALL JOINT FITTINGS TO BE ASSEMBLED WITH STAINLESS STEEL #316 TEFLON COATED NUTS AND BOLTS.
- 3) MINIMUM OF THREE (3) ZINC ANODES (6 OUNCE MIN) ZINC ANODES INSTALLED ON EVERY OTHER BOLT OF EACH MECHANICAL JOINT FITTING.
- 4) ALL MATERIALS MUST BE MANUFACTURED AND STAMPED WITH THE CURRENT CALENDAR YEAR (MADE IN THE U.S.A.)



VILLAGE OF MUNDELEIN
ENGINEERING DETAILS

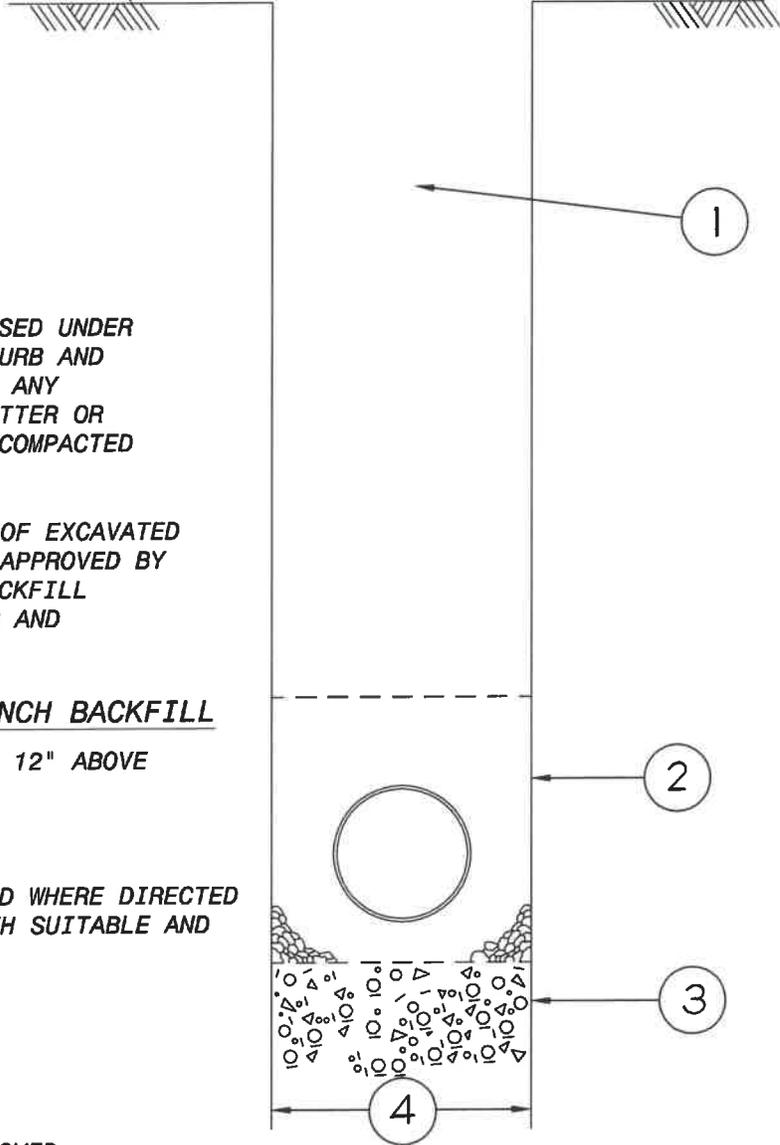
WATERMAIN PRESSURE
CONNECTION TAPPING
VALVE W/5' DIA. VAULT
(FOR WATERMANS
10" & SMALLER)

DETAIL NO.

W-3

REVISIONS				REVISIONS			
REV.	BY	DATE	REVISION	REV.	BY	DATE	REVISION
1.	NDJ	04-04-05	APPROVED	4.	JRB	01-01-19	APPROVED
2.	JRB	04-14-15	APPROVED	5.	JRB	07-01-19	PER VILLAGE COMMENTS
3.	JRB	02-27-17	PER WATER DEPARTMENT	6.			

FINISHED GRADE



① SELECT TRENCH BACKFILL

GRANULAR TRENCH BACKFILL TO BE USED UNDER EXISTING OR PROPOSED PAVEMENT, CURB AND GUTTER, SIDEWALK OR WITHIN 2' OF ANY EXISTING OR PROPOSED CURB AND GUTTER OR SIDEWALK, SHALL BE MECHANICALLY COMPACTED CA-6, (NON-LIMESTONE)

MECHANICALLY COMPACTED BACKFILL OF EXCAVATED MATERIALS IN OTHER LOCATIONS IF APPROVED BY THE ENGINEER. REFER TO TRENCH BACKFILL SPECIAL PROVISIONS FOR MATERIALS AND COMPACTION REQUIREMENTS.

② PIPE BEDDING & INITIAL TRENCH BACKFILL

#6 WASHED STONE FROM 6" BELOW TO 12" ABOVE TOP OF PIPE

③ UNSUITABLE MATERIALS

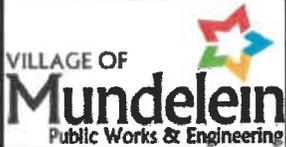
IF ENCOUNTERED - SHALL BE REMOVED WHERE DIRECTED BY THE ENGINEER AND REPLACED WITH SUITABLE AND COMPACTED MATERIAL

④ TRENCH WIDTH

MINIMUM = PIPE O.D. + 12"
MAXIMUM = PIPE O.D. + 36"

NOTES:

1. ALL CA-6 MATERIAL TO BE IDOT APPROVED.

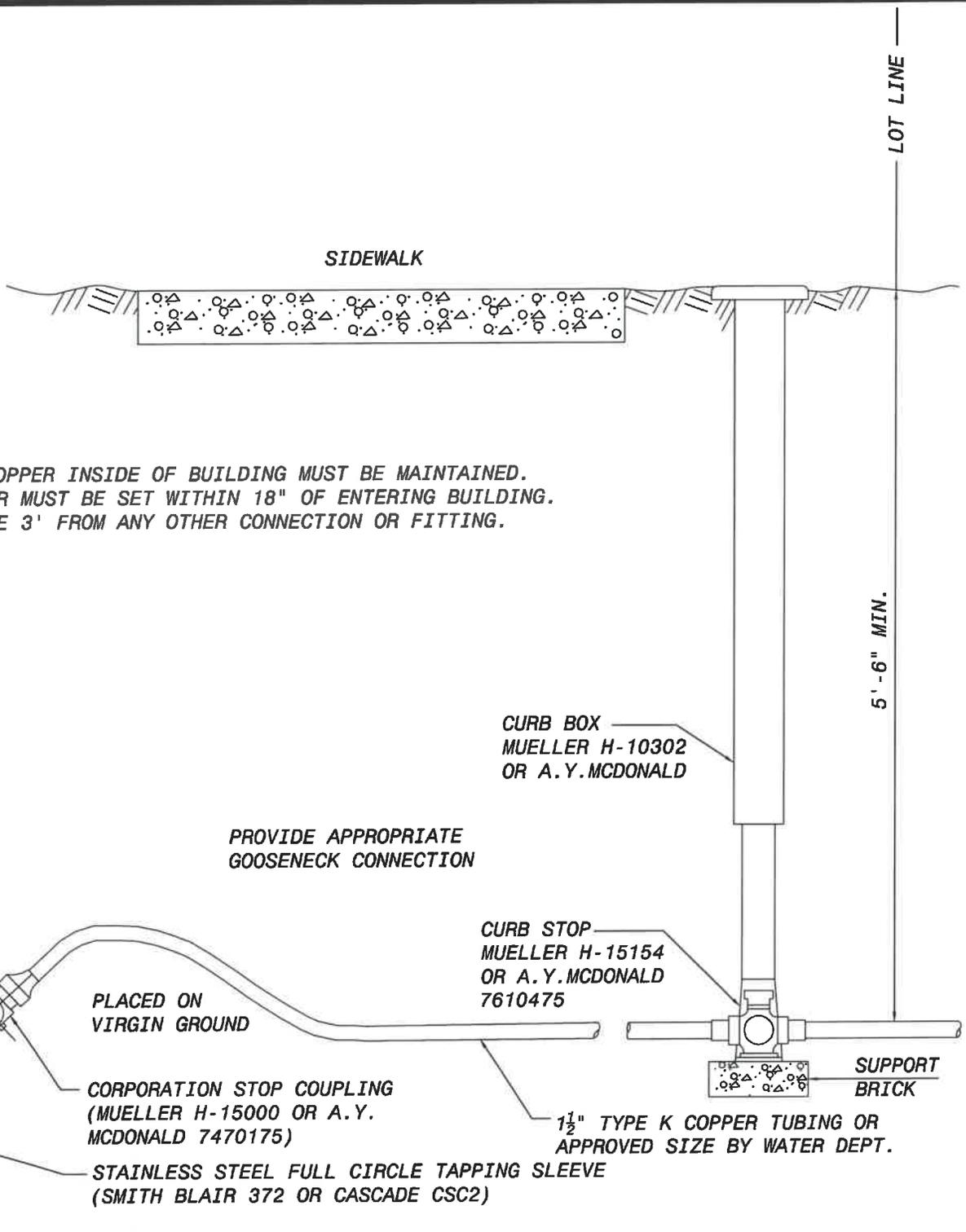


VILLAGE OF MUNDELEIN
ENGINEERING DETAILS

TYPICAL WATERMAIN
TRENCH CROSS-SECTION

REVISIONS				REVISIONS			
REV.	BY	DATE	REVISION	REV.	BY	DATE	REVISION
1.	MDJ	04-04-05	APPROVED	4.			
2.	JRB	01-01-19	APPROVED	5.			
3.				6.			

DETAIL NO.
W-4



NOTES:

- 1. 12" FREE COPPER INSIDE OF BUILDING MUST BE MAINTAINED.
- 2. WATER METER MUST BE SET WITHIN 18" OF ENTERING BUILDING.
- 3. TAP MUST BE 3' FROM ANY OTHER CONNECTION OR FITTING.

NOTES:

- 1. NO COUPLINGS PERMITTED BETWEEN CORPORATION AND CURB STOP.
- 2. NO COUPLINGS PERMITTED BETWEEN CURB STOP AND BUILDING
- 3. NO LIMESTONE BACKFILL SHALL COME IN CONTACT WITH COPPER OR BRASS.
- 4. B-BOXES MUST BE LOCATED IN A GRASSY NON-PAVED AREA.

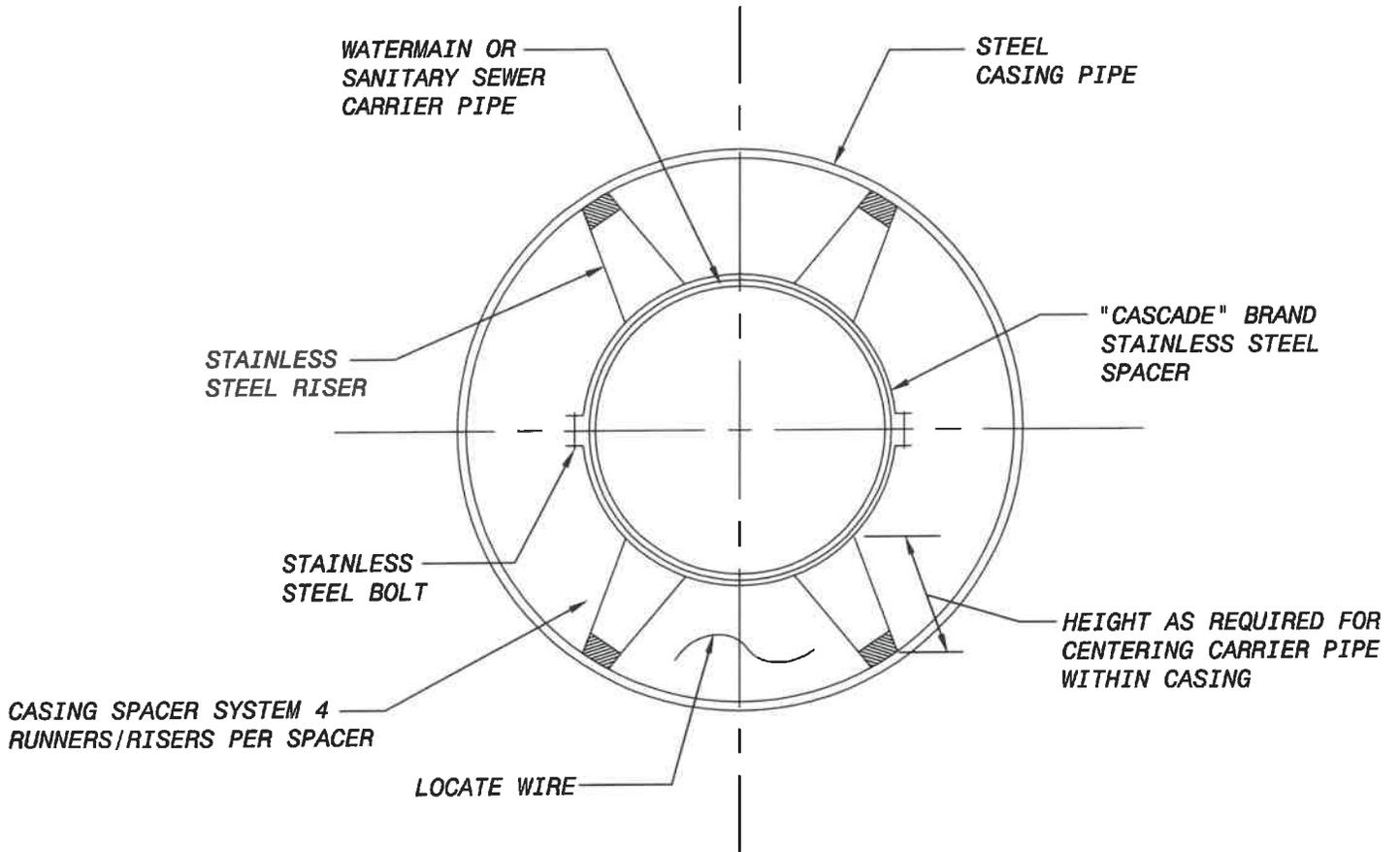


VILLAGE OF MUNDELEIN
ENGINEERING DETAILS

WATER SERVICE
CONNECTION

REVISIONS				REVISIONS			
REV.	BY	DATE	REVISION	REV.	BY	DATE	REVISION
1.	MDJ	04-04-05	APPROVED	4.			
2.	JRB	01-01-19	APPROVED	5.			
3.				6.			

DETAIL NO.
W-5



CARRIER PIPE I.D.	CASING PIPE I.D.	PIPE T
6"	12"	0.375"
8"	16"	0.375"
12"	24"	0.500"
ADDITIONAL SIZES PER VILLAGE APPROVAL		

- NOTE:**
- 1) NUMBER OF SPACERS REQUIRED FOR EACH SECTION OF PIPE PER MANUFACTURER'S SPECIFICATIONS.
 - 2) BRICK AND MORTAR ENDS OF PIPE.
 - 3) NO SAND FILLER REQUIRED.
 - 4) LOCATING WIRE INSTALLED WITH PIPE.



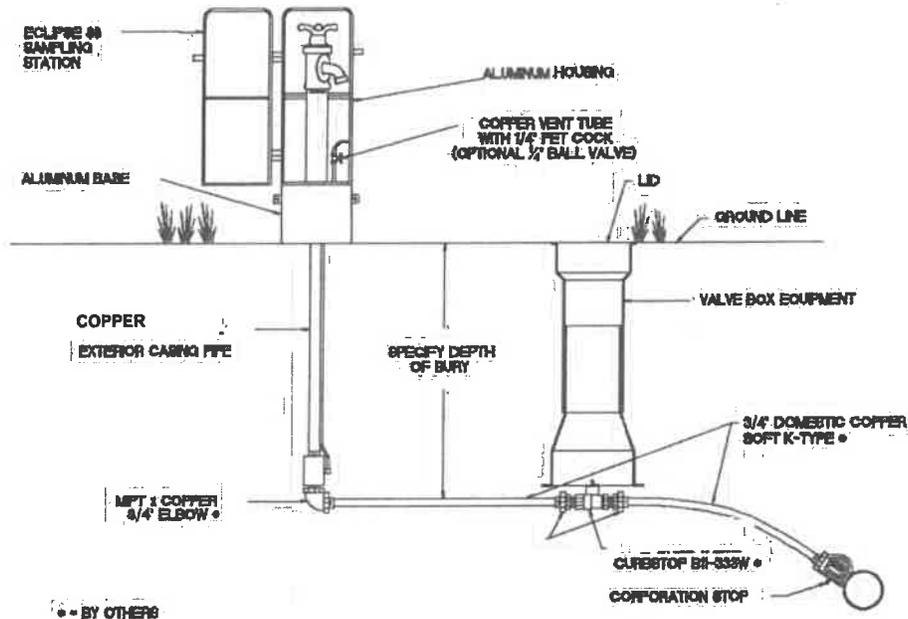
VILLAGE OF MUNDELEIN
ENGINEERING DETAILS

STEEL CASING PIPE

REVISIONS				REVISIONS			
REV.	BY	DATE	REVISION	REV.	BY	DATE	REVISION
1.	MDJ	04-04-05	APPROVED	4.			
2.	JRB	01-01-19	APPROVED	5.			
3.				6.			

DETAIL NO.
W-6

STAINLESS STEEL ECLIPSE NO. #88-SS SAMPLING STATION



Sampling Stations shall be 6' bury, with a 3/4" FIP Inlet, and a (3/4" hose or unthreaded) nozzle.

All stations shall be enclosed in a lockable, nonremovable, aluminum-cast housing.

When opened, the station shall require no key for operation, and the water will flow in an all brass waterway.

All working parts will also be of brass and be removable from above ground with no digging. Exterior piping shall be brass.

A copper vent tube will enable each station to be pumped free of standing water to prevent freezing and to minimize bacteria growth.

Eclipse No. #88-SS Sampling Station shall be manufactured by Kupferle Foundry, St Louis, MO 63102.

REVISIONS				REVISIONS			
REV.	BY	DATE	REVISION	REV.	BY	DATE	REVISION
1.	JRB	01-01-19	APPROVED	4.			
2.	JRB	07-01-19	PER VILLAGE COMMENTS	5.			
3.				6.			

Water Main Testing Specifications

Pressure and Leakage Test

A. Testing Procedures

1. All pressure leakage testing shall be tested against installed pipe, fittings, valves, joints, and fire hydrants up to nozzles.

B. Valve Operations

Village of Mundelein Water Division personnel are the only individuals authorized to operate any water valves.

C. Taps for Testing

Contractor/developer is required to provide one (1)-inch service taps in manholes for test gauges, flushing needs, and for disinfection at each end of the pipe test section.

1. Service tap will include a full circle stainless steel tapping sleeve, per the detail.
2. Contractor shall make the tap connection using an approved tapping tool on PVC C-909 piping. Contractor shall provide removed coupon to Village of Mundelein Water Division Inspector.
3. Contractor shall schedule an appointment with the Village of Mundelein Water Division for the witnessing/inspection of all taps. 24-hour notice prior to appointment must be provided to the Village of Mundelein Water Division.
4. Contractor shall remove copper tube with goose neck assembly from manholes upon completion of testing and chlorination procedures.

D. Air Removal

Before applying the specified test pressure, air shall be expelled completely from the section of piping under test. Air removal will be done in conjunction with the flushing procedures of the water main (see Flushing Requirements.)

E. Allowable Leakage

No pipe installations will be accepted if the leakage is greater than that determined by the following formula:

In inch-pound units,

$$L = \frac{SD\sqrt{P}}{133,200}$$

Where:

L	=	allowable leakage, in gallons per hour
S	=	length of pipe tested, in feet
D	=	nominal diameter of the pipe, in inches
P	=	average test pressure during the leakage test, in pounds per square inch (gauge)

In metric units,

$$Lm = \frac{SD\sqrt{P}}{715,317}$$

Where:

LM	=	allowable leakage, in liters per hour
S	=	length of pipe tested, in meters
D	=	nominal diameter of the pipe, in millimeters
P	=	average test pressure during the leakage test, in kPa

These formulas are based on an allowable leakage of 11.85 gpd/mi/in. of nominal diameter at a pressure of 150 psi.

When testing against closed metal-seated valves, an additional leakage per closed valve of 0.0078 gal/b/in. of nominal valve size shall be allowed. When hydrants are in the test section, the test shall be made against the main valve in the hydrant.

F. Acceptance of Installation

1. Acceptance shall be determined as the basis of allowable leakage or the procedures established by the Village of Mundelein Engineering Department. If any test of laid pipe discloses leakage greater than that specified, repairs or replacements shall be accomplished in accordance with the Specifications.
2. All visible leaks are to be repaired regardless of the amount of leakage.
3. Dye or any other form of colorizing the water will not be introduced into the water main for the purpose of locating leaks.

Disinfection of Water Mains

Water main disinfection will be in accordance with the State of Illinois Rules and Regulations Title 35, Subtitle F, Chapter 11, Section 652.203 of the Technical Policy Statement.

A. Flushing Water Main

1. Sections of pipe to be disinfected shall first be flushed to remove any solids or contaminated material that may have become lodged in the pipe. Fire hydrants in these sections will be flushed using either the two and a half (2 ½)-inches nozzle or the pumper nozzle to develop a velocity of at least two and five-tenths (2 5/10)-feet per second in the main.
2. All fire hydrants will be flushed and operated in the section of water main to be tested/disinfected.
3. Village of Mundelein Water Division personnel are the only individuals authorized to operate any water valves.
4. All valves that are closed will have a tap with copper tube and goose neck assembly installed in the vault for the purpose of flushing, and disinfecting the water main to the furthest end point of each section being tested.

B. Requirement of Chlorine

Before being placed into service, all new mains and repaired portion of, or extensions to existing mains shall be chlorinated so that the initial chlorine residual is not less than 50 mg/L and that a chlorine residual of not less than 25 mg/L remains in the water after standing 24 hours in the pipe. **** NO CHLORINE GAS ALLOWED****

1. Liquid Chlorine

A chlorine liquid mixture shall be applied by means of a solution-feed chlorinating device. The liquid solution must be fed directly through proper devices for regulating the rate of flow and providing effective dilution of the liquid chlorine solution into the water within the pipe being treated. Chlorinating devices for feeding solutions of the liquid chlorine must provide means for preventing the backflow of water into the chlorine solution.

2. Chlorine- Bearing Compounds in Water

This method must have prior approval from the Village of Mundelein Water Superintendent before introduction. A mixture of water and high-test calcium hypo chlorite (65-70% Chlorine) may be substituted for the chlorine gas water mixture. The dry powder shall first be mixed as a paste and then thinned to a one (1) percent chlorine solution by adding water to give a total quantity of seven and five-tenths (7 5/10) gallons of water per pound of dry powder. This solution shall be injected in one (1) end of the section of main to be disinfected while filling the main with water in the amounts as shown in the table which follows:

Chlorine Requirements to Produce to mg/1 Concentration in 100-feet of Pipe – By Diameter		
Pipe Size In Inches	100 %Chlorine, Lb.	1 % Chlorine Solution, Gals.
4	0.027	0.33
6	0.061	0.73
8	0.108	1.30
10	0.170	2.04
12	0.240	2.88

3. Tablet Disinfection

This method must have prior approval from Village of Mundelein Water Superintendent before introduction. Since preliminary flushing must be eliminated in using this method, it should be utilized only when scrupulous cleanliness has been used in construction. It shall not be used if trench water or foreign material has entered the main or if the water is below 41° F, or if the piping length exceeds 50 linear feet.

Tablets should be placed in each section of pipe, hydrants, hydrant branches, and other appurtenances. Tablets must be at the top of the main and shall be attached by an adhesive approved by the Village Water Superintendent. Tablets in joints between pipe sections, hydrants, hydrant branches, or appurtenances are to be crushed and placed inside the annular space, rubbed like chalk in butt ends of sections to coat them if the type of assembly does not permit crushing.

In filling a section of piping with water when using the tablet method water velocity shall be less than one (1)-foot per second.

Number of 5-Grain Hypochlorite Tablets Required For a Dosage of 50 MG/L per Length of Pipe Section					
Pipe Size (Inches)	Length of Pipe Section (Feet)				
	Up to 13	18	20	30	40
2	1	1	1	1	1
4	1	1	2	2	2
6	2	2	3	3	4
10	3	5	7	7	9
12	5	6	10	10	14

B. Point of Application

The preferred point of application of the chlorinating agent is at the beginning of the pipeline extension or any valved section of it, and through a corporation stop inserted in the pipe.

1. The contractor will install corporation stops with a copper tube gooseneck assembly for the purpose of disinfecting and as sample collection point at each branch, dead end, or a location which has a closed valve. Fire hydrants will be disinfected as part of this procedure.
2. At a point not to exceed five (5)-feet downstream from the beginning of the new main the water entering the new main will receive a dose of chlorine fed at a constant rate such that the water will have not less than 25 mg/L free chlorine.
3. Water from the existing distribution system shall be made to flow at a constant rate into the new main.
4. The Village of Mundelein Water Division personnel must witness the disinfection process. An appointment with 24-hour prior notice must be scheduled with Village of Mundelein Water Division.
5. In the process of chlorinating newly laid pipe, all valves, fire hydrants, or other appurtenances shall be operated while the pipe line is filled with the chlorinating agent and under normal operating pressures.

Disinfection of Water Services (Larger Than Two (2)-Inches)

For the purpose of clarifying this section, a water service in this section refers to one (1) or more of the following installations that terminate inside of a building under construction.

1. The service line being installed is for the purpose of a combination domestic and fire protection use.
2. The service line being installed is for the purpose of branching into multiple domestic services inside of a meter room.
3. The service line is the section of main being tested from the Village of Mundelein right-of-way valve to a location inside of the building.
4. There are no fire hydrants installed on the service line.

A. Meter Rooms/Building Installations

1. The service line will be disinfected to the inside permanent valve of the meter room prior to any branch service being connected.
2. The meter room will have a permanent heating system installed and in working condition prior to the disinfection.
3. One (1) sample point will be provided at the source and one (1) sample point will be provided at the inside valve provided the length of pipe does not exceed 1,000-feet.
4. The contractor will supply a copper tube gooseneck assembly at each of the sample points.
5. The Village of Mundelein in Water Division personnel must witness the disinfection process. An appointment with 24 hours prior notice must be scheduled with Village of Mundelein Water Division.

B.

Domestic/Fire Service Mains/Meter Room

1. The service line will be disinfected up to the inside valve on both the fire branch and the domestic branch.
2. The Fire Service Main Branch will have a valve of equal size to the riser section installed prior to chlorination.
3. The building, meter room, or location of the incoming service line will have a permanent heating system installed and in working condition prior to the disinfection.
4. One (1) sample point will be provided at the source and one (1) sample point will be provided at the inside valve provided the length of pipe does not exceed 1,000-feet.
5. The contractor will supply a copper tube goose neck assembly at each of the sample points.
6. The Village of Mundelein Water Division personnel must witness the disinfection process. An appointment with 24 hours prior notice must be scheduled with Village of Mundelein Water Division.

Dechlorination Requirements

Following chlorination, all treated water shall be thoroughly flushed from the newly laid pipe using the fire hydrant(s) and/or all the copper gooseneck assemblies. The flushing shall replace the highly chlorinated water with water that has a chlorine residual of less than 1mg/1 or equal to the residual from the supply service.

1. The discharging of chlorinated water must be expelled to the surrounding ground surface.
2. The contractor/developer must comply with all of the I.E.P.A. Rules, Regulations, and Standards for dechlorinating water as part of the discharging.
3. The contractor/developer is responsible for the equipment and materials to dechlorinate the water at each point it is discharging.
4. The Village of Mundelein Water Division personnel are the only individuals authorized to operate the valves.
5. The Village of Mundelein Water Division personnel must witness the dechlorination procedures when flushing the water mains. An appointment with 24-hour prior notice must be scheduled with Village of Mundelein Water Division.

Sampling and Testing

Sample collection for bacterial testing will start immediately after flushing the highly chlorinated water from the system and prior to any portion of the water main being placed into service. Samples will be collected at all sample points designated by the Village of Mundelein Water Superintendent. Sampling procedures must follow the I.E.P.A. Standards for construction of new water mains.

A. Locations and Spacing

1. Samples will be collected from each dead end, branch lateral, or section of pipe that has a closed valve. Samples will be collected from the copper tube with gooseneck assembly at these points.
2. Samples will be collected from fire hydrants at points not to exceed 1,000-feet of linear water main.
3. A sample will be collected from the copper goose-neck assembly point that is located no further than five (5)-feet downstream from the beginning of the new water main.

B. Collection Requirements

1. The contractor is required to collect all samples at the location(s) designated by the Village of Mundelein Water Superintendent.
2. Village of Mundelein Water Division personnel are the only individuals authorized to operate any water valves and must witness all samples at time of collection. 24-hour prior notice must be scheduled with the Village of Mundelein Water Division.
3. The contractor is required to take the collected samples to a certified laboratory approved by the Village of Mundelein Water Superintendent.

4. The Village of Mundelein Water Division has the right to collect quality control samples at the same time contractor collects samples. The charges for the quality control samples will be charged to the contractor.
5. Samples will be collected on consecutive days with at least 24-hours of separation between the collection times.
6. Each sample collected will be tested for quality and must show the absence of coliform organisms.

C. Satisfactory Sample Results

If all the samples tested meet the Bacterial Quality Standards and are certified as satisfactory by the testing lab:

1. The contractor may have the lab e-mail the results directly to the Village of Mundelein Water Division;
2. The contractor must provide original copies of the certified results to the Village of Mundelein Water Superintendent within seven (7) business days of the date on the test results; and
3. The contractor must contact the Village of Mundelein Water Division to schedule an appointment to have the water main placed into service within 72 hours of the satisfactory test results being certified and only as approved by the Water Superintendent.

Unsatisfactory Sample Results

If anyone (1) of the samples tested fails to meet the Bacterial Quality Standards and is deemed unsatisfactory, then all the samples collected on the same date for the tested section of pipe, will be considered unsatisfactory.

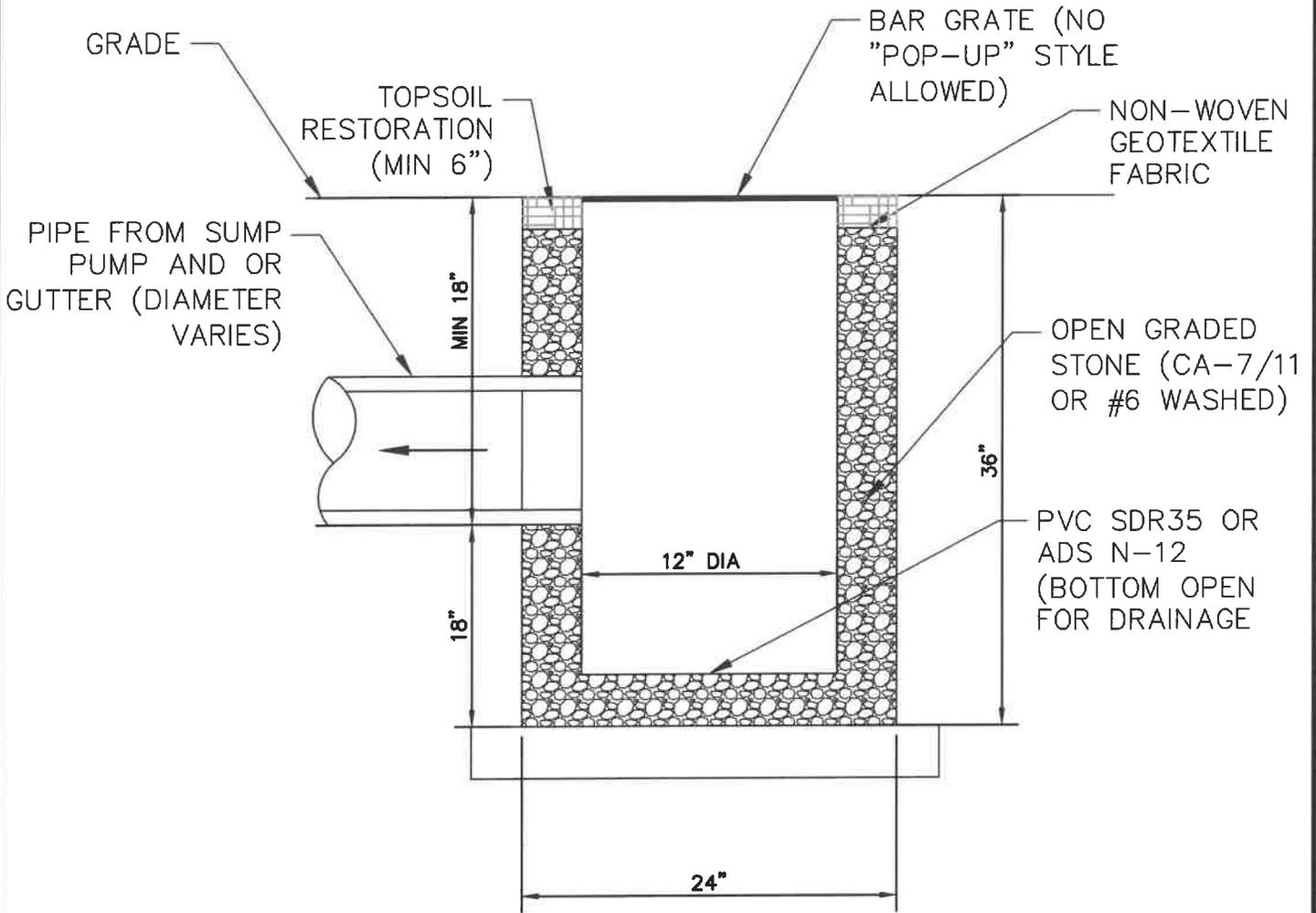
1. Unsatisfactory samples from the first day of collection will be discarded. A new first day collection must be scheduled with the second day to be consecutive.
2. Unsatisfactory samples from the second day of collection will be discarded. First day samples will also be discarded and the contractor must schedule new first and second day samples.

The contractor will have up to three (3) chances of first day and two (2) chances of second day bacterial testing to obtain satisfactory results on all the samples collected and tested.

3. Should the contractor fail to obtain satisfactory results after the allotted attempts, the water main section being tested is to have the original disinfection procedures repeated until satisfactory results are obtained.

Meter Room Requirements

(Future Section) Contact Public Works Department in the interim.



VILLAGE OF MUNDELEIN
ENGINEERING DETAILS

SUMP PUMP DRY BASIN
DETAIL

REVISIONS				REVISIONS			
REV.	BY	DATE:	REVISION:	REV.	BY	DATE:	REVISION:
1.				4.			
2.				5.			
3.				6.			

DETAIL NO.

Required Easement Language/Widths

1. All new subdivisions shall contain the applicable easements as described below. The specific language for each easement must appear on the Final Plat, verbatim as described below.

Village Utility Easements: Areas, other than in the right-of-way, where water main, sanitary sewer, storm sewer or other underground utilities to be maintained by the Village are located, Village Utility Easements must not be less than fifteen (15)-feet wide, seven and one-half (7 ½)-feet of which may be shown on each of two (2) adjacent lots.

AN EXCLUSIVE EASEMENT IS HEREBY RESERVED FOR AND GRANTED TO THE VILLAGE OF MUNDELEIN, ILLINOIS AND ITS RESPECTIVE SUCCESSORS AND ASSIGNS, WITHIN THE AREAS SO DESIGNATED ON THE PLAT AND MARKED VILLAGE UTILITY EASEMENT (VUE) TO CONSTRUCT, INSTALL, RECONSTRUCT, REPAIR, REMOVE, REPLACE, INSPECT, MAINTAIN AND OPERATE UNDERGROUND TRANSMISSION AND DISTRIBUTION SYSTEMS AND LINES IN, UNDER, ACROSS, ALONG AND UPON THE SURFACE OF THE VILLAGE UTILITY EASEMENT INCLUDING WITHOUT LIMITATION WATER MAINS, STORM SEWERS, SANITARY SEWERS, FORCE MAINS, ELECTRIC LINES AND ALL NECESSARY FACILITIES APPURTENANT THERETO, TOGETHER WITH THE RIGHT OF ACCESS THERETO FOR THE PERSONNEL AND EQUIPMENT NECESSARY AND REQUIRED FOR SUCH USES AND PURPOSES, AND TOGETHER WITH THE RIGHT TO INSTALL REQUIRED SERVICE CONNECTIONS UNDER THE SURFACE OF EACH LOT TO SERVE IMPROVEMENTS THEREON. TOGETHER WITH THE RIGHT TO CUT, TRIM, OR REMOVE TREES, BUSHES AND ROOTS AS MAY BE REASONABLY REQUIRED INCIDENTAL TO THE RIGHTS HEREIN GIVEN, AND THE RIGHT TO ENTER UPON THE PROPERTY FOR ALL SUCH PURPOSES. IMPROVEMENTS OR OBSTRUCTIONS SHALL NOT BE PLACED OVER GRANTEE'S FACILITIES OR IN, UPON, OR OVER THE PROPERTY WITHIN SAID EASEMENT. SAID EASEMENT MAY BE USED FOR DRIVEWAYS AND PARKING. THE GRADES OF THE SUBDIVIDED PROPERTY APPROVED BY THE VILLAGE ENGINEER SHALL NOT BE ALTERED IN ANY MANNER BY THE INSTALLATION OF ANY OF THE FACILITIES OF SAID GRANTEE SO AS TO INTERFERE WITH THE PROPER OPERATION AND MAINTENANCE THEREOF OR WITH THE SURFACE DRAINAGE THEREON. FENCES ONLY AT PROPERTY OWNERS RISK AND EXPENSE TO REMOVE AND TO REINSTALL AS REQUIRED BY VILLAGE OF MUNDELEIN MAINTENANCE REPAIR OR REPLACEMENT NEEDS.

Public Utility Easements: Areas used by "Franchise" public utility companies such as electric, natural gas, cable television, telephone, etc. for utility distribution or transmission installations; such easements shall be located along the rear lot lines, side lot lines or front lot lines. They shall occupy not less than ten (10)-feet of which five (5)-feet may be shown on each of two (2) adjacent lots. Public Utility Easements shall not be used for drainage purposes except that they may be graded as a drainage swale. No improvements or obstructions permitted within the easement.

A NON-EXCLUSIVE EASEMENT IS HEREBY RESERVED FOR AND GRANTED TO SBC, NICOR, COMMONWEALTH EDISON COMPANY, COMCAST, AND HOLDERS OF FRANCHISES GRANTED BY THE VILLAGE OF MUNDELEIN, ILLINOIS AND THEIR RESPECTIVE SUCCESSORS AND ASSIGNS, WITHIN THE AREAS SO DESIGNATED ON THE PLAT AND MARKED PUBLIC UTILITY RECONSTRUCT, REPAIR, REMOVE,

REPLACE, INSPECT, MAINTAIN AND OPERATE UNDERGROUND TRANSMISSION AND DISTRIBUTION SYSTEMS AND LINES IN, UNDER, ACROSS, ALONG AND UPON THE SURFACE OF THE UTILITY EASEMENT INCLUDING WITHOUT LIMITATION, GAS MAINS, TELECOMMUNICATION CABLES, ELECTRIC CABLES, CABLE TELEVISION LINES AND ALL NECESSARY FACILITIES APPURTENANT THERETO, TOGETHER WITH THE RIGHT OF ACCESS THERETO FOR THE PERSONNEL AND EQUIPMENT NECESSARY AND REQUIRED

FOR SUCH USES AND PURPOSES, AND TOGETHER WITH THE RIGHT TO INSTALL REQUIRED SERVICE CONNECTIONS UNDER THE SURFACE OF EACH LOT TO SERVE IMPROVEMENTS THEREON. TOGETHER WITH THE RIGHT TO CUT, TRIM, OR REMOVE TREES, BUSHES AND ROOTS AS MAY BE REASONABLY REQUIRED INCIDENTAL TO THE RIGHTS HEREIN GIVEN, AND THE RIGHT TO ENTER UPON THE PROPERTY FOR ALL SUCH PURPOSES. IMPROVEMENTS OR OBSTRUCTIONS SHALL NOT BE PLACED OVER GRANTEE'S FACILITIES OR IN, UPON, OR OVER THE PROPERTY WITHIN SAID EASEMENT. SAID EASEMENT MAY NOT BE USED FOR LANDSCAPING, GARDENS, DRIVEWAYS AND PARKING. THE GRADES OF THE SUBDIVIDED PROPERTY APPROVED BY THE VILLAGE ENGINEER SHALL NOT BE ALTERED IN ANY MANNER BY THE INSTALLATION OF ANY OF THE FACILITIES OF SAID GRANTEE'S SO AS TO INTERFERE WITH THE PROPER OPERATION AND MAINTENANCE THEREOF OR WITH THE SURFACE DRAINAGE THEREON. FENCES ONLY AT PROPERTY OWNER'S RISK AND EXPENSE TO REMOVE AND TO REINSTALL AS REQUIRED BY VILLAGE OF MUNDELEIN MAINTENANCE REPAIR OR REPLACEMENT NEEDS.

Utility Easements: Areas, other than in the right-of-way, where Village utilities and the public utilities follow a common route, said easements shall be of adequate width for the purpose intended, but in no case shall it be less than twenty (20)-feet.

A NON-EXCLUSIVE EASEMENT IS HEREBY RESERVED FOR AND GRANTED TO THE VILLAGE OF MUNDELEIN, ILLINOIS, SBC, NICOR, COMMONWEALTH EDISON COMPANY, COMCAST, AND HOLDERS OF FRANCHISES GRANTED BY THE VILLAGE OF MUNDELEIN, ILLINOIS AND THEIR RESPECTIVE SUCCESSORS AND ASSIGNS, WITHIN THE AREAS SO DESIGNATED ON THE PLAT AND MARKED UTILITY EASEMENT (UE) TO CONSTRUCT, INSTALL, RECONSTRUCT, REPAIR, REMOVE, REPLACE, INSPECT, MAINTAIN AND OPERATE UNDERGROUND TRANSMISSION AND DISTRIBUTION SYSTEMS AND LINES IN, UNDER, ACROSS, ALONG AND UPON THE SURFACE OF THE UTILITY EASEMENT INCLUDING WITHOUT LIMITATION WATER MAINS, STORM SEWERS, SANITARY SEWERS, FORCE MAINS, GAS MAINS, TELECOMMUNICATION CABLES, ELECTRIC CABLES, CABLE TELEVISION LINES AND ALL NECESSARY FACILITIES APPURTENANT THERETO, TOGETHER WITH THE RIGHT OF ACCESS THERETO FOR THE PERSONNEL AND EQUIPMENT NECESSARY AND REQUIRED FOR SUCH USES AND PURPOSES, AND TOGETHER WITH THE RIGHT TO INSTALL REQUIRED SERVICE CONNECTIONS UNDER THE SURFACE OF EACH LOT TO SERVE IMPROVEMENTS THEREON. TOGETHER WITH THE RIGHT TO CUT, TRIM, OR REMOVE TREES, BUSHES AND ROOTS AS MAY BE REASONABLY REQUIRED INCIDENTAL TO THE RIGHTS HEREIN GIVEN, AND THE RIGHT TO ENTER UPON THE PROPERTY FOR ALL SUCH PURPOSES. IMPROVEMENTS OR OBSTRUCTIONS SHALL NOT BE PLACED OVER GRANTEE'S FACILITIES OR IN, UPON, OR OVER THE PROPERTY WITHIN SAID EASEMENT. SAID EASEMENT MAY NOT BE USED FOR LANDSCAPING, GARDENS, DRIVEWAYS AND PARKING.

THE GRADES OF THE SUBDIVIDED PROPERTY APPROVED BY THE VILLAGE ENGINEER SHALL NOT BE ALTERED IN ANY MANNER BY THE INSTALLATION OF ANY OF THE FACILITIES OF SAID GRANTEE'S SO AS TO INTERFERE WITH THE PROPER OPERATION AND MAINTENANCE THEREOF OR WITH THE SURFACE DRAINAGE THEREON. FENCES ONLY AT PROPERTY OWNER'S RISK AND EXPENSE TO REMOVE AND TO REINSTALL AS REQUIRED BY VILLAGE OF MUNDELEIN MAINTENANCE REPAIR OR REPLACEMENT NEEDS.

Drainage Easements: Areas where a subdivision is traversed by a water course, drainage way, channel or stream, the Drainage Easement shall conform substantially with the lines of such water course and shall include further width as will be necessary for the purpose of adequately maintaining or improving the water course. Said easements shall not be used for any other purposes except that utilities may cross this easement, provided that the crossing does not alter the intended use of the easement.

Landscape Easement: Areas designated on the plat for the express purpose of providing protective screen planting to secure a reasonably effective physical barrier between different land uses to minimize adverse conditions of sight and sound.

A NON-EXCLUSIVE EASEMENT IS HEREBY RESERVED FOR AND GRANTED TO THE PROPERTY OWNER'S ASSOCIATION AS MAY BE FURTHER DEFINED IN THE PROPERTY OWNER'S ASSOCIATION BYLAWS AND DECLARATIONS AND THEIR RESPECTIVE SUCCESSORS AND ASSIGNS, WITHIN THE AREAS SO DESIGNATED ON THE PLAT AND MARKED LANDSCAPE EASEMENT (LE) TO INSTALL, REPAIR, REMOVE, REPLACE, INSPECT, AND MAINTAIN LANDSCAPE PLANTINGS AS DEPICTED ON THE SUBDIVISION LANDSCAPE PLAN IN, UNDER, ACROSS, ALONG AND UPON THE SURFACE OF THE LANDSCAPE EASEMENT INCLUDING WITHOUT LIMITATION ALL NECESSARY FACILITIES APPURTENANT THERETO, TOGETHER WITH THE RIGHT OF ACCESS THERETO FOR THE PERSONNEL AND EQUIPMENT NECESSARY AND REQUIRED FOR SUCH USES AND PURPOSES. NO PERMANENT BUILDINGS, STRUCTURES OR FENCES SHALL BE CONSTRUCTED OR MAINTAINED ON, ACROSS OVER OR THROUGH SAID EASEMENT NOR SHALL VEGETATION BE REMOVED EXCEPT TO REPLACE DEAD OR DISEASED VEGETATION WITH LIKE SPECIES WITHIN SAID EASEMENT WITHOUT PRIOR WRITTEN CONSENT OF THE GRANTEE AND THE VILLAGE OF MUNDELEIN. THE GRADES OF THE SUBDIVIDED PROPERTY APPROVED BY THE VILLAGE ENGINEER SHALL NOT BE ALTERED IN ANY MANNER BY THE INSTALLATION AND MAINTENANCE OF LANDSCAPE PLANTINGS OF SAID GRANTEES SO AS TO INTERFERE WITH THE PROPER OPERATION AND MAINTENANCE THEREOF OR WITH THE SURFACE DRAINAGE THEREON.

Stormwater Management Easement: Areas used for the purposes of operating and maintaining stormwater runoff management facilities such as detention and or retention basins and appurtenant structures and overland flood routes.

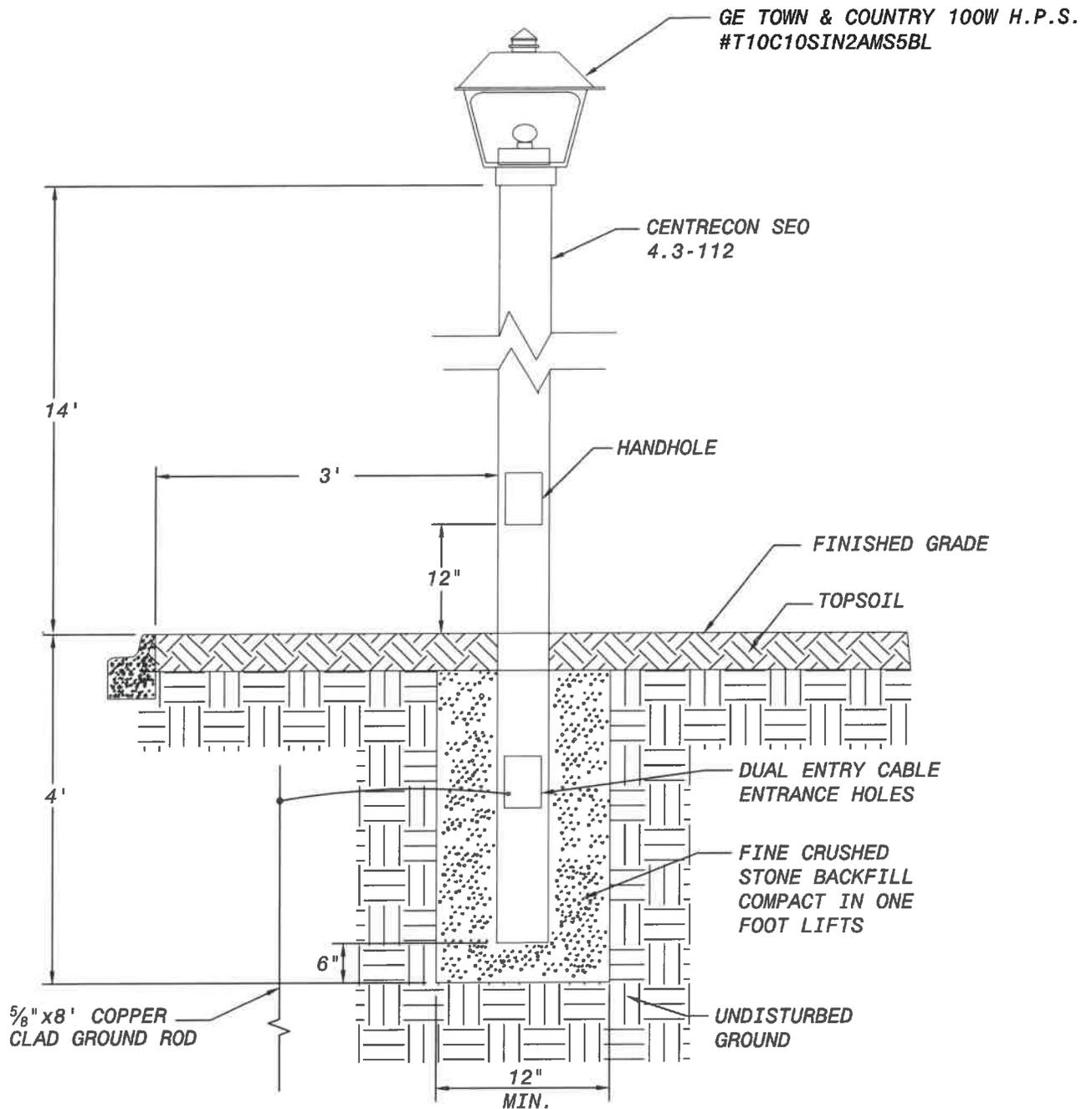
A STORMWATER MANAGEMENT EASEMENT IS HEREBY RESERVED FOR AND GRANTED TO THE VILLAGE OF MUNDELEIN, ILLINOIS WITHIN THE AREAS DESIGNATED ON THE PLAT AS STORMWATER MANAGEMENT EASEMENT FOR THE COLLECTION CONVEYANCE AND STORAGE OF STORMWATER IN AREAS TO BE MAINTAINED BY THE OWNER OF THE LOT(S) OR OUTLOT(S) ON WHICH THE FACILITIES EXIST IN ACCORDANCE WITH VILLAGE ORDINANCES AND THE APPROVED FINAL ENGINEERING IMPROVEMENT PLANS. ENCROACHMENT OF ANY DETERMINED SAID ENCROACHMENT WILL NOT INTERFERE WITH THE PROPER FUNCTION OF SAID FACILITIES. THE VILLAGE SHALL HAVE THE RIGHT TO ENTER

KIND INCLUDING LANDSCAPING, FENCES, SHEDS OR ACCESSORY STRUCTURES WITHIN SAID EASEMENT IS PROHIBITED UNLESS THE VILLAGE ENGINEER HAS WITH PERSONNEL AND EQUIPMENT UPON SAID EASEMENT AT ANY TIME FOR THE PURPOSES OF ACCESS TO AND INSPECTION OF THE STORMWATER MANAGEMENT FACILITIES LOCATED WITHIN SAID EASEMENT. IF THE OWNER FAILS TO MAINTAIN SAID FACILITIES AND, AFTER RECEIPT OF NOTICE FROM THE VILLAGE OF SAID FAILURE, THE OWNER FAILS TO MAKE REQUIRED REPAIRS IN A REASONABLE PERIOD OF TIME, THE VILLAGE MAY MAKE THE REQUIRED REPAIRS AND SEEK REIMBURSEMENT FROM THE OWNER FOR THE COSTS INCURRED BY THE VILLAGE TO MAKE THE REPAIR AND/OR FILE A LIEN ON THE PROPERTY.

Sight Triangle Restriction: At a point 25-feet in any direction from the point of intersection of the street rights-of-way, improvements (i.e. signs, fences, shrubs, trees, etc.) may not exceed a height of three (3)-feet above the established grade. This restriction must be designated at all street intersections within the subdivision.

NO IMPROVEMENT SUCH AS FENCES, SIGNS, LANDSCAPING, ETC., SHALL BE ERECTED OR CONSTRUCTED WHICH MAY OBSTRUCT OR REDUCE TRAFFIC SIGHT LINES OR MAY CREATE ANY TRAFFIC HAZARD.

10. All permanent type pavements or other permanent improvements, which abut the proposed improvements, and must be removed, shall be saw cut prior to removal in accordance with the Village Engineering Policies and Details. All items so removed shall be replaced with similar construction materials, to their original condition or better.
11. During construction operations the contractor shall insure positive drainage at the conclusion of each workday. Drainage may be achieved by ditching, piping, or an acceptable method, as approved by the Engineering Department.
12. The contractor shall comply with all State and Federal Safety Regulations as outlined in the latest revisions of the Federal Construction Safety Standards (Series 26) and with applicable provisions and regulations of the Occupational Safety and Health Administration.
13. The contractor shall keep a set of "Approved" Construction Plans on the job site and shall maintain a legible record on said plans of any field changes to alignment and/or to plans and specifications of proposed improvements upon completion of the contractor's work, said plans will be given to the Village of Mundelein in order for copies to be reproduced.
14. No structure shall have more than eight (8)-inches of precast concrete adjusting rings.
15. All frames and grates shall be adjusted to finish grade. The frames and adjusting rings shall be aligned with the precast concrete structure opening it pertains to. If the structure is to be used as a curb and gutter storm water inlet structure, the structure opening must be aligned with the existing or proposed curb and gutter.
16. All structures (manholes, inlets, catch basin sumps, valve vaults, auxiliary valve boxes, and "B" boxes) shall be cleaned out at the end of the project and prior to Village acceptance. Sanitary and storm sewer mains shall be jet cleaned if evidence of debris build-up is present at the time of Village acceptance.



NOTE:

1. PHOTOCCELL SHALL BE LOCATED ON THE STREET LIGHT CONTROLLER CABINET.
2. THIS DETAIL TO BE USED ONLY FOR EXISTING DEVELOPMENTS, PROPOSED FUTURE PHASES OF EXISTING DEVELOPMENTS OR FOR IN-FILL DEVELOPMENTS WHERE THIS TYPE OF LIGHTING SURROUNDS A PROPOSED DEVELOPMENT. APPROVAL OF VILLAGE ENGINEER REQUIRED TO UTILIZE THIS LIGHTING TYPE.

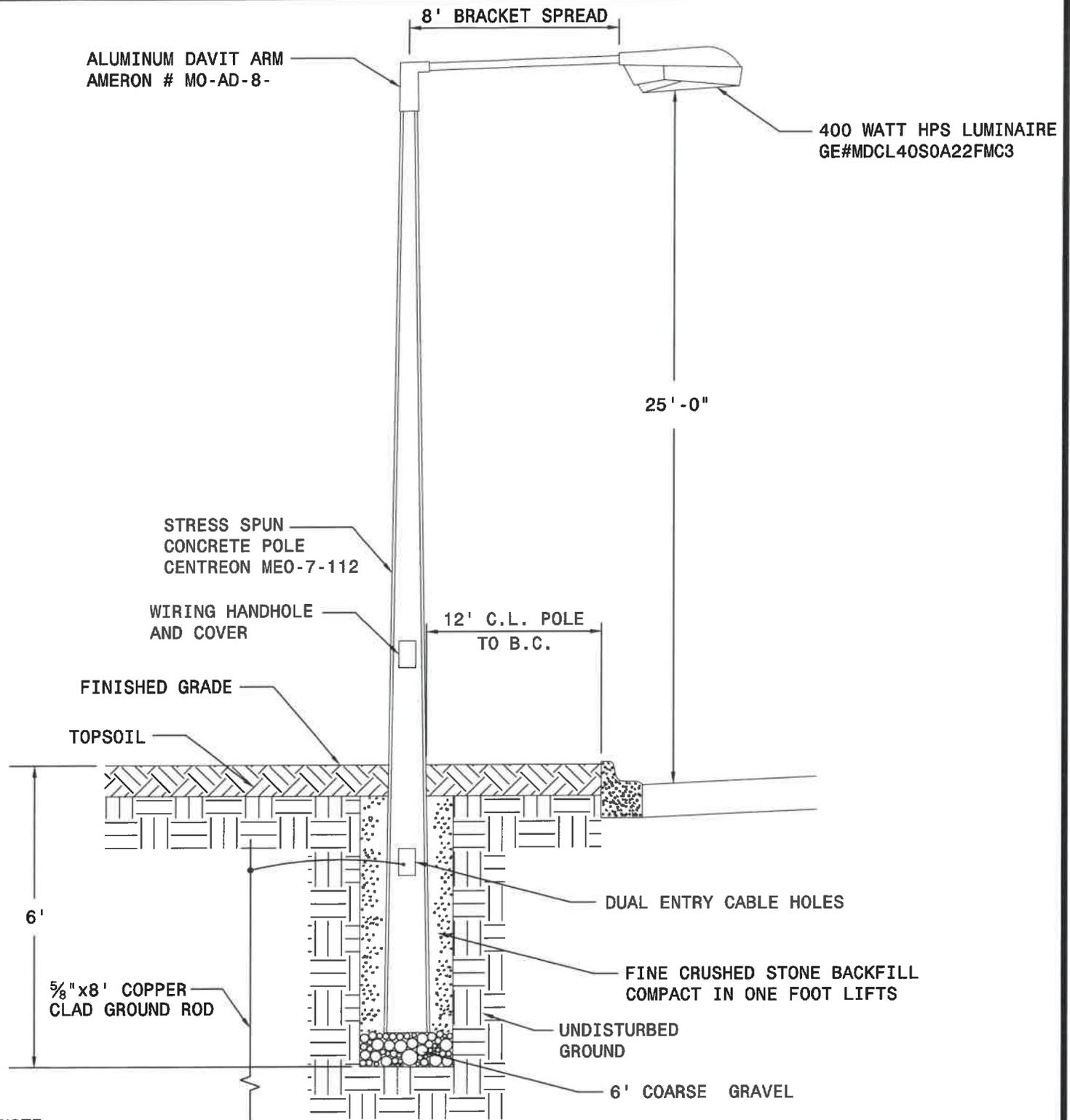


VILLAGE OF MUNDELEIN
ENGINEERING DETAILS

EXISTING RESIDENTIAL STREET
LIGHT DETAIL
(For Existing or In-Fill
Developments)

REVISIONS				REVISIONS			
REV.	BY	DATE:	REVISION:	REV.	BY	DATE:	REVISION:
1.	MDJ	04-04-05	APPROVED	4.			
2.	JRB	01-01-19	APPROVED	5.			
3.				6.			

DETAIL NO.
L-3



NOTE:

1. PHOTOCELL SHALL BE LOCATED ON THE STREET LIGHT CONTROLLER CABINET.
2. THIS DETAIL TO BE USED ONLY FOR EXISTING DEVELOPMENTS, PROPOSED FUTURE PHASES OF EXISTING DEVELOPMENTS OR FOR IN-FILL DEVELOPMENTS WHERE THIS TYPE OF LIGHTING SURROUNDS A PROPOSED DEVELOPMENT. APPROVAL OF VILLAGE ENGINEER REQUIRED TO UTILIZE THIS LIGHTING TYPE.



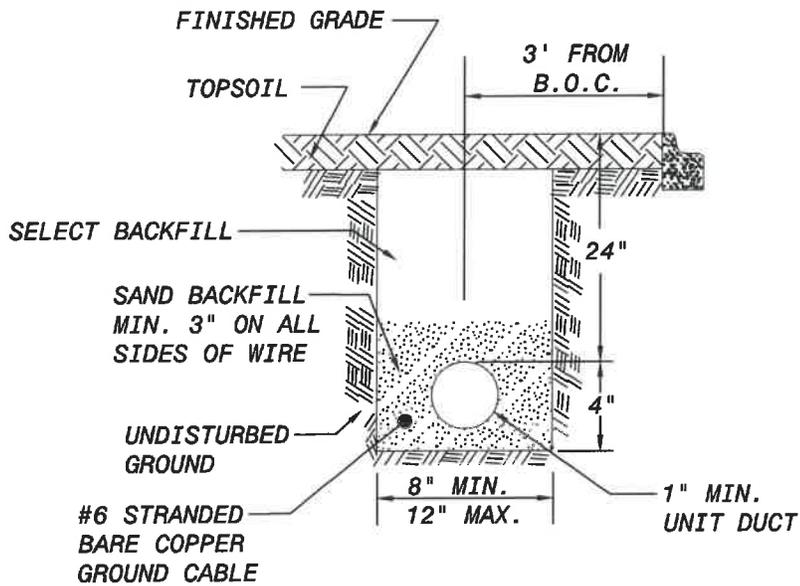
VILLAGE OF MUNDELEIN
ENGINEERING DETAILS

EXISTING RESIDENTIAL STREET
LIGHT DETAIL At Intersections
with Arterial or Collector Streets
(For Existing or
In-Fill Developments)

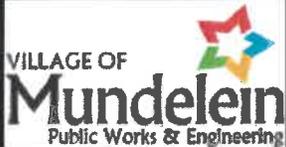
DETAIL NO.

L - 4

REVISIONS				REVISIONS			
REV.	BY	DATE:	REVISION:	REV.	BY	DATE:	REVISION:
1.	MDJ	04-04-05	APPROVED	4.			
2.	JRB	01-01-19	APPROVED	5.			
3.				6.			



NOTE:
 A CABLE INSPECTION IS REQUIRED PRIOR TO BACKFILL.
 CONTACT VILLAGE OF MUNDELEIN ENGINEERING DEPT. TO
 SCHEDULE.



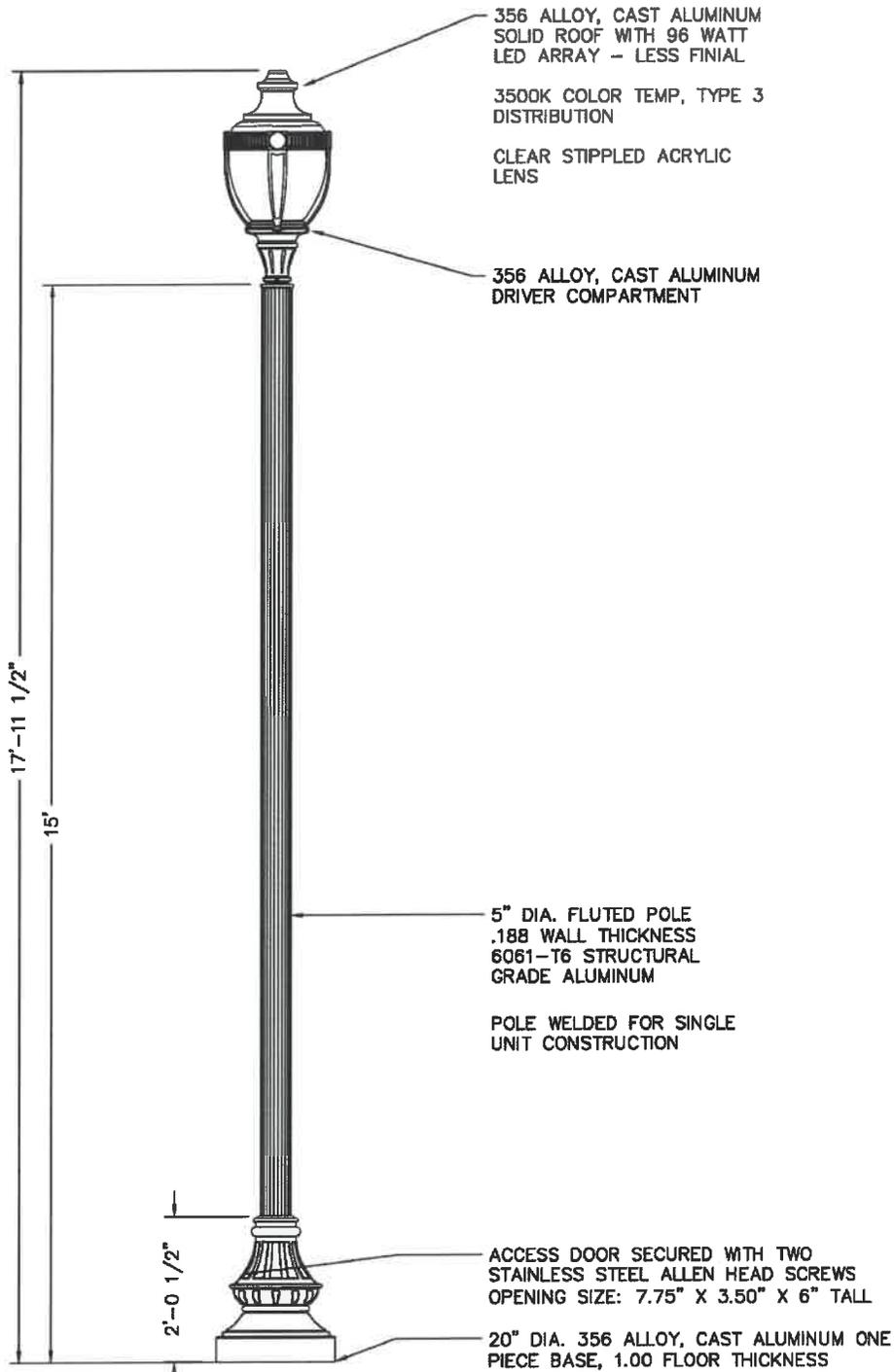
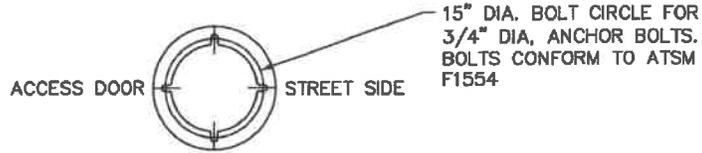
VILLAGE OF MUNDELEIN
 ENGINEERING DETAILS

STREET LIGHTING
 CABLE TRENCH DETAIL

REVISIONS				REVISIONS			
REV.	BY	DATE:	REVISION:	REV.	BY	DATE:	REVISION:
1.	MDJ	04-04-05	APPROVED	4.			
2.	JRB	01-01-13	APPROVED	5.			
3.				6.			

DETAIL NO.

L-5



A670TASRLED-NF/5PPT/5215FP5/6ARC45T3/ML/BK



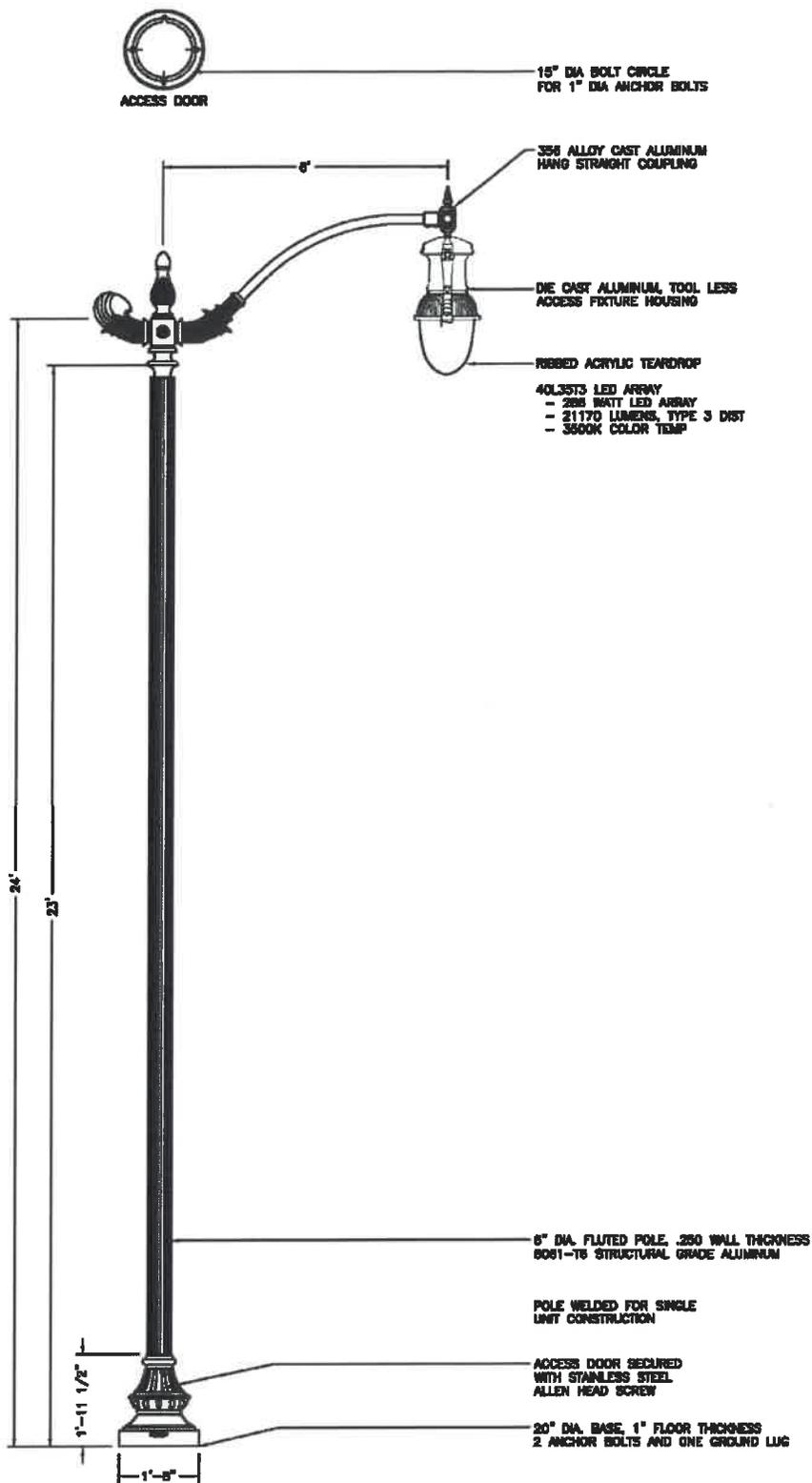
VILLAGE OF MUNDELEIN
ENGINEERING DETAILS

STERNBERG POLE
LED DETAIL

REVISIONS				REVISIONS			
REV.	BY	DATE:	REVISION:	REV.	BY	DATE:	REVISION:
1.	JRB	01-01-19	APPROVED	4.			
2.				5.			
3.				6.			

DETAIL NO.

L-7



1-1914LEDF/A/HS-H/FFA6/5223FP6.250/40L45T3-MDL21/BK



VILLAGE OF MUNDELEIN
 ENGINEERING DETAILS

STERNBERG MAST ARM
 LED DETAIL

REVISIONS			
REV.	BY	DATE	REVISION
1.	JRB	01-01-19	APPROVED
2.			
3.			

REVISIONS			
REV.	BY	DATE	REVISION
4.			
5.			
6.			

DETAIL NO.

L-8