VILLAGE OF MINOOKA

Construction Standards and Specifications
For Storm Sewer

General Provisions

The storm sewer system shall be constructed in accordance with the requirements of Federal and State statutes or regulations; Standard Specifications for Road and Bridge Construction adopted by the Illinois Department of Transportation on January 1, 2002; the Standard Specifications For Water and Sewer Main Construction in Illinois, (Fifth Edition May 1996); Subdivision Regulations for the Village of Minooka. In addition, the following standards shall apply:

IL EPA Construction Permit

- An approved IL EPA NPDES Construction Permit must be submitted to the IL EPA. The permit authorizing construction of the storm sewer system must be received by the Superintendent of Public Works before construction begins.

General

- All material shall be manufactured in the United States of America. A Letter of Certification of the Country of origin will be provided if requested by the Village.

- All frames shall be set on bitumastic material.

Pipe Material

- Reinforced concrete pipe with "O" ring joints, ASTM C-361, C-443 or C-507.

- Corrugated polyethylene pipe with smooth interior such as ADS N-12 or approved equal (outside of dedicated street R.O.W. only).

- Minimum size is 12”.

Manholes

- All storm manholes shall be precast reinforced concrete with an eccentric cone section.

- All manholes shall be a minimum of four feet (4') inside diameter unless larger pipe diameters dictate otherwise.

- All manholes shall have no more than two adjusting rings with a minimum of four inches (4") and a maximum of twelve inches (12") of adjusting rings.

- Rubber adjusting rings are required for any rings that are two inches (2") in thickness, or less.

- All manholes shall be set on a six-inch (6") CA-7 cushion.

- All lifting holes, joints between precast reinforced concrete sections shall be tuck pointed with hydraulic cement.

- All steps shall be fiberglass or neoprene coated.

- All steps shall be aligned.

- All manholes shall have pre cast fillets.

Manhole Frame & Covers

- Shall be NEENAH R-1712, type B, heavy duty with gasketed self sealing closed lid with STORM cast on cover, (type A would be an open lid) or EAST JORDAN IRON WORKS 1050 with type M1open grate frame with a heavy duty self sealing lid with STORM cast on cover.

Catch Basins

- No catch basin shall be located in rear yards.

Sump Pump Collector Inlet

- Shall be an Inlet Type A and would follow the basic inlet detail as found in the Village Standards for type A inlets.

- Shall be provided at every other single family lot corner for the collection of sump water lines.

- Shall be provided at every other dwelling unit for the collection of sump water lines from all multi family units.

Sump Pump Collector Inlet Frame & Grate

- Shall be a NEENAH R-2502 with a Type "D" grate or EAST JORDAN IRON WORKS 1022 frame with an M1 grate.

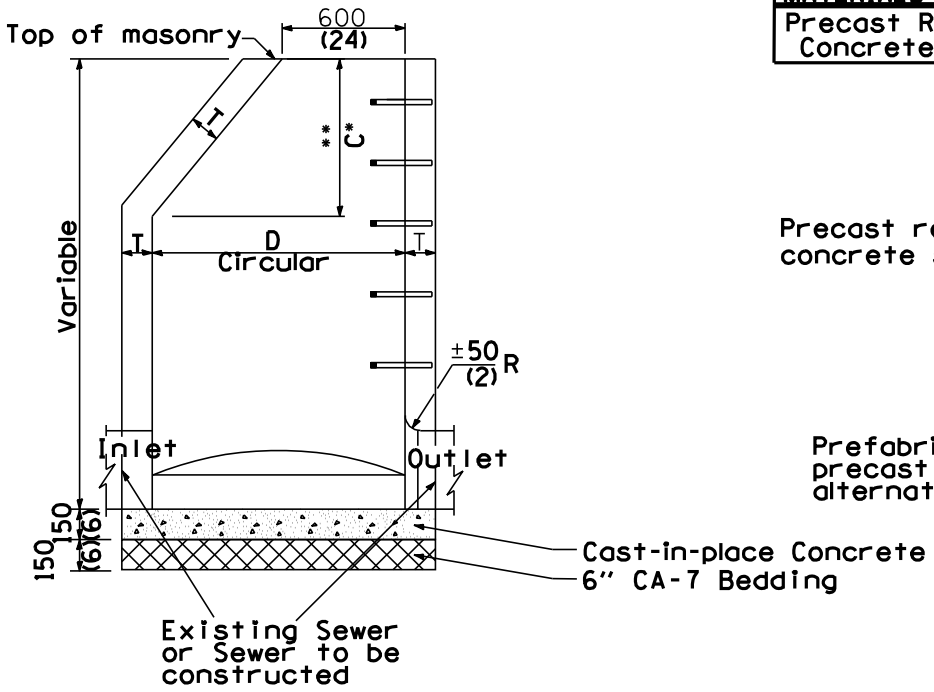
Roll Curb Inlet Frame & Grate

- For three inch (3") residential subdivision roll curbs a NEENAH R-3501-P or EAST JORDAN IRON WORKS 7525 frame and grate is required.

Barrier Curb Inlet Frame & Grate

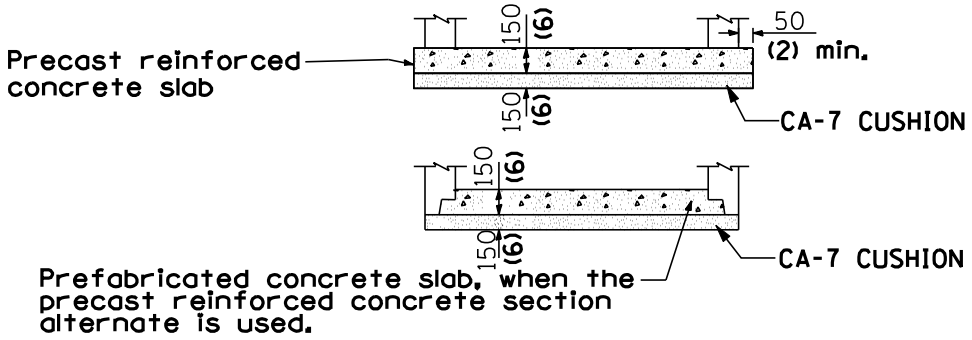
- For six inch (6") barrier curb a NEENAH R-3278-A type C grate or EAST JORDAN IRON WORKS frame 7210 with a type MI grate and type T1 back.

STORM MANHOLE
TYPE A – 4' – 5' DIA.



ELEVATION - ECCENTRIC

ALTERNATE MATERIALS FOR WALLS	D	C	T (min.)
Precast Reinforced Concrete Section	1.2 m (4'-0") 1.5 m (5'-0")	750 (30) 1.15 m(3'-9")	100 (4) 125 (5)



ALTERNATE BOTTOM SLAB

GENERAL NOTES

* Dimension "C" for Precast Reinforced Concrete Sections may vary from the dimension given to plus 150 mm (6").

** See Standard 2170 for Optional Precast Reinforced Concrete Flat Slab Top.

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

4' DIA. MH FOR PIPES 18" OR LESS

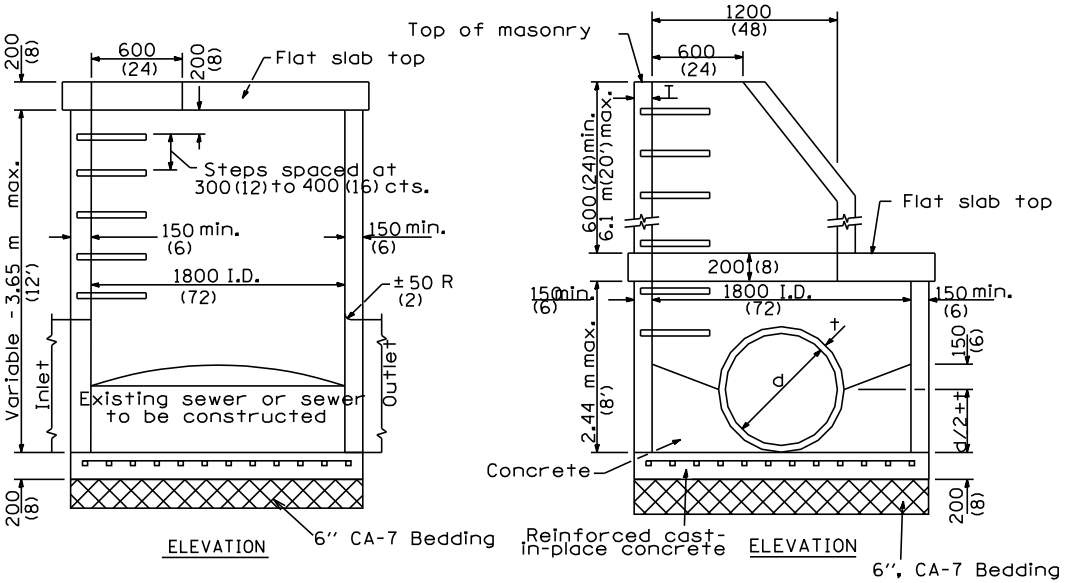
5' DIA. MH FOR PIPES 21" TO 42"

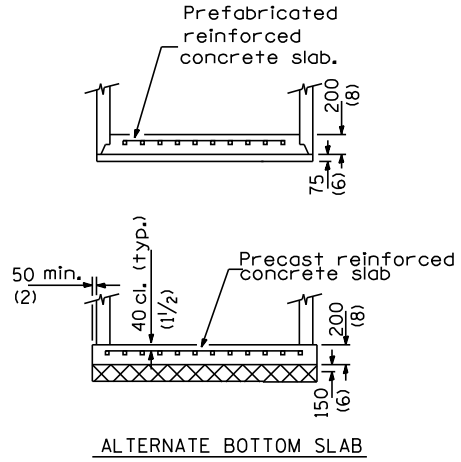
MINOOKA STANDARD

VERSION 1.0

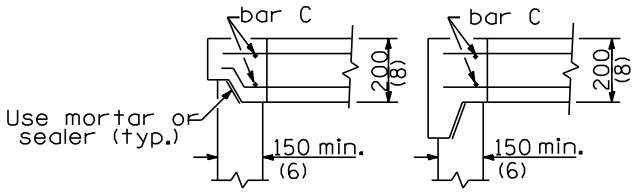
STORM MANHOLE – TYPE A – 6' DIA.

FOR PIPES 48" AND LARGER





ALTERNATE BOTTOM SLAB



ALTERNATE JOINT CONFIGURATIONS

MATERIALS FOR WALLS	T (min)
Precast Reinforced Concrete Sections	100 (4)

GENERAL NOTES

Joint configuration and dimensions of flat slab top shall match and fit the riser joint detail.

Lifting devices shall be approved by the Engineer.

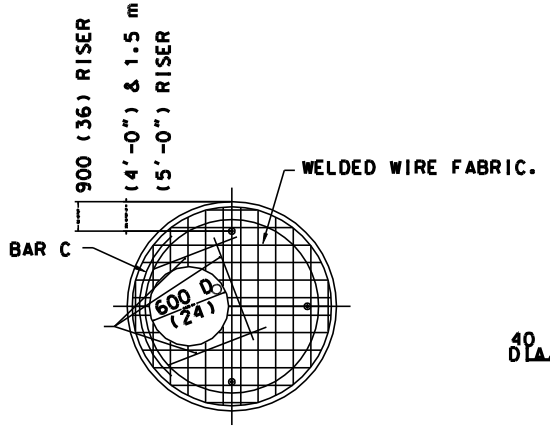
See Standard 2170 for details of cast iron steps.

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

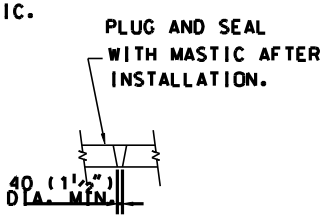
MINOOKA STANDARD

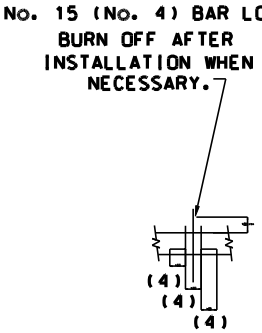
VERSION 1.0

FLAT TOP STORM MANHOLE
TYPE A – 4′ – 5′ DIA.

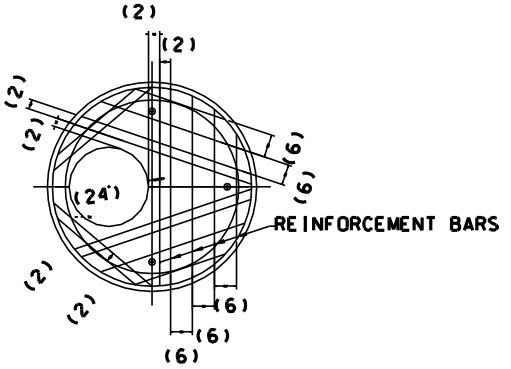


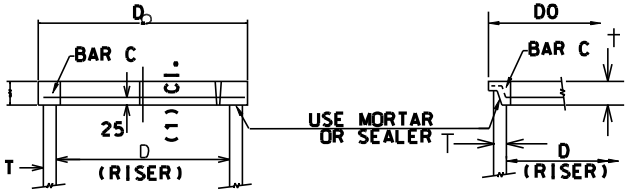
PLAN





LIFTING HOLE OR LIFTING LOOP
TYPICAL
(3 REQUIRED PER SLAB)

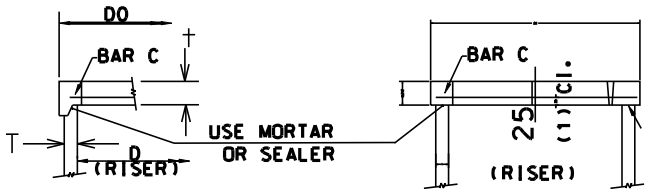




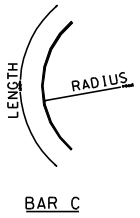
SECTION A-A

ALTERNATE JOINT CONFIGURATIONS
TABLE

PLAN



SECTION B-B



D	T	D_O (MIN)	t	REINFORCEMENT "As" W.W.F. EACH DIRECTION	REINFORCEMENT BAR SIZE	No. 15 (No. 4) BAR C LENGTH	No. 15 (No. 4) BAR C RADIUS
900 (36)	SEE STANDARDS	D + 2T	150 (6)	425 mm 2/ m (.20 IN 2/FT.)	No.15 (No. 4)	1.2 m (4'-0")	480 (19)
1.2 m (4'-0")			150 (6)	740 mm 2/ m (.35 IN 2/FT.)	No.15 (No. 5)	1.35 m (4'-0")	660 (26)
1.5 m (5'-0")			200 (8)	740 mm 2/ m (.35 IN 2/FT.)	No.15 (No. 5)	1.5 m (5'-0")	810 (32)

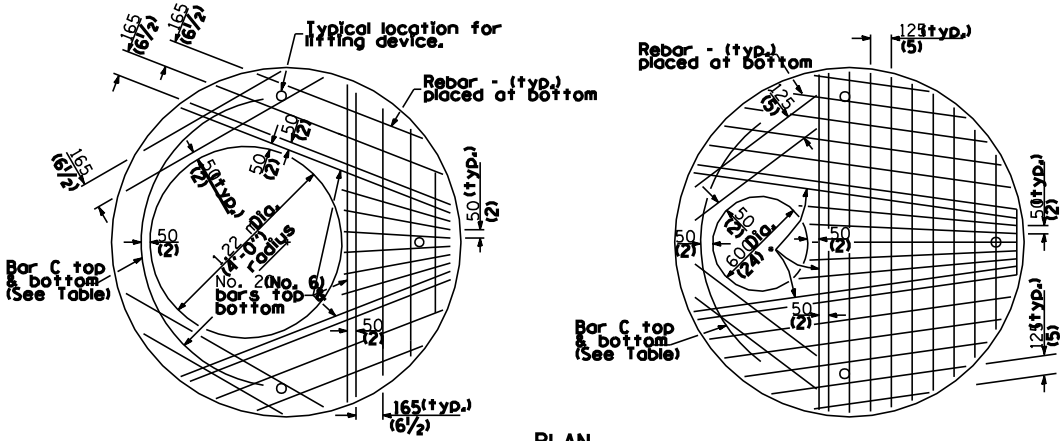
GENERAL NOTES

The flat slab top may be used in lieu of the tapered tops shown on standards 2110. 2120 2150. or 2160 at the option of the contractor or when field conditions prohibit the use of tapered tops.
All dimensions are in millimeters (inches) unless otherwise shown..

MINOOKA STANDARD

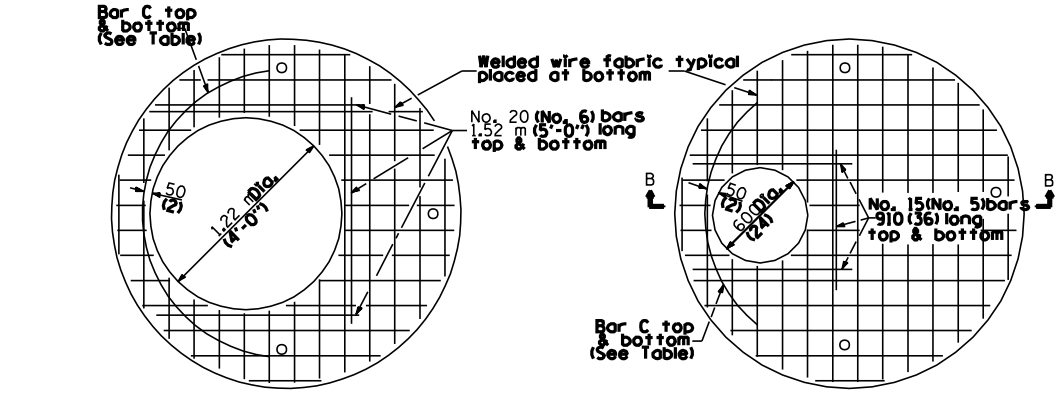
VERSION 1.0

STORM MANHOLE – TYPE A – 6' DIA.

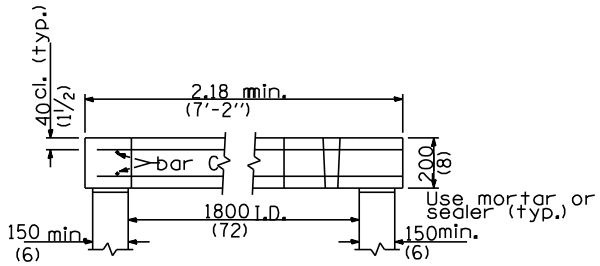


PLAN
Showing Rebar Reinforcement

Diameter of opening	Thick-ness	Reinforcement "As" WWF Each direction	Bar Size	No. 15 (No. 4) Bar C	
				Length	Radius
600 (24)	200 (8)	2244 mm²/m (1.06) sq.in./ft.	No. 20 (No. 6)	1.83 m (6'-0")	965 (38)
1.2 m (4'-0")	200 (8)	1736 mm²/m (0.82) sq.in./ft.	No. 20 (No. 6)	2.74 m (9'-0")	965 (38)



PLAN
Showing Welded Wire Fabric Reinforcement



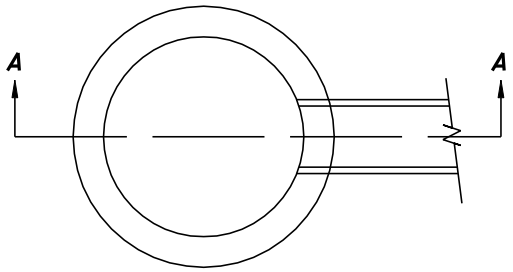
SECTION B-B

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

MINOOKA STANDARD

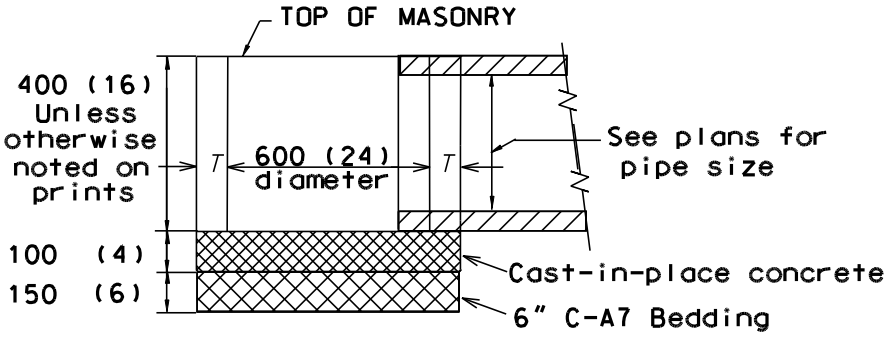
VERSION 1.0

INLET – TYPE A



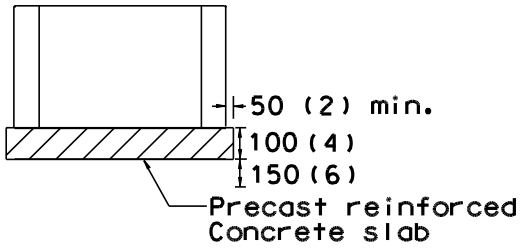
PLAN

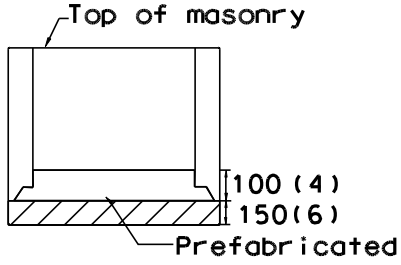
MATERIALS FOR WALLS	T
PRECAST REINFORCED CONCRETE SECTION	75 (3)



SECTION A-A

Pipe to be laid on a minimum grade of 1%





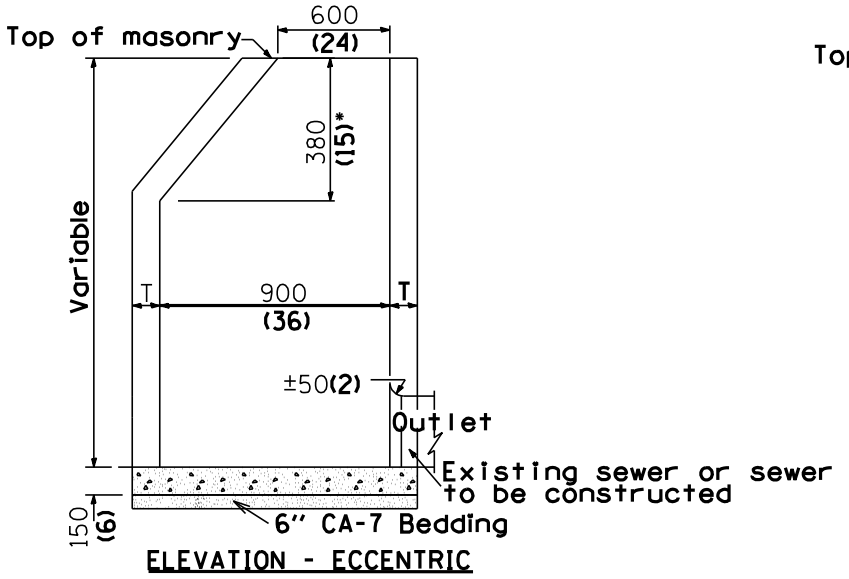
ALTERNATE METHODS

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

MINOOKA STANDARD

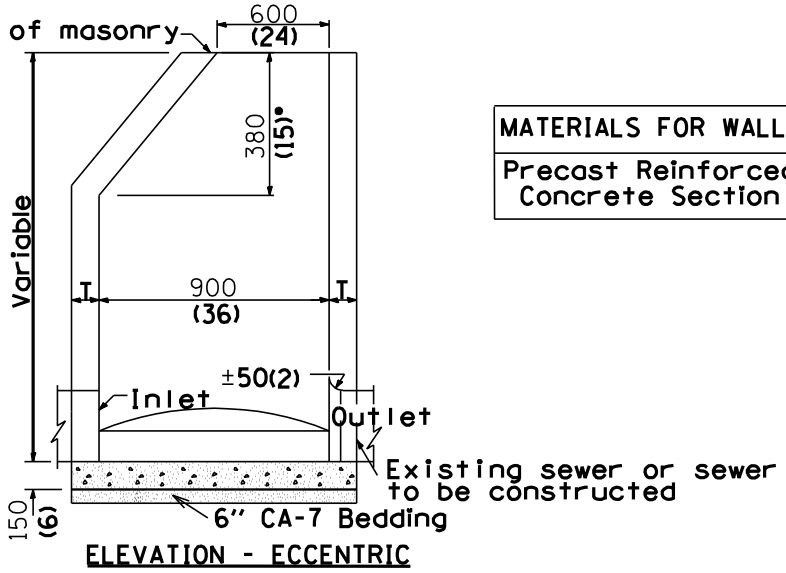
VERSION 1.0

INLET – TYPE B



ELEVATION - ECCENTRIC

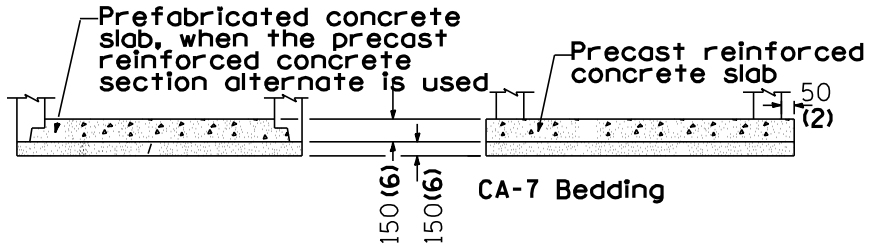
INLET WITH OUTLET PIPE ONLY



ELEVATION - ECCENTRIC

INLET WITH INLET AND OUTLET PIPES

MATERIALS FOR WALLS	T (min.)
Precast Reinforced Concrete Section	75 (3)



ALTERNATE BOTTOM SLAB

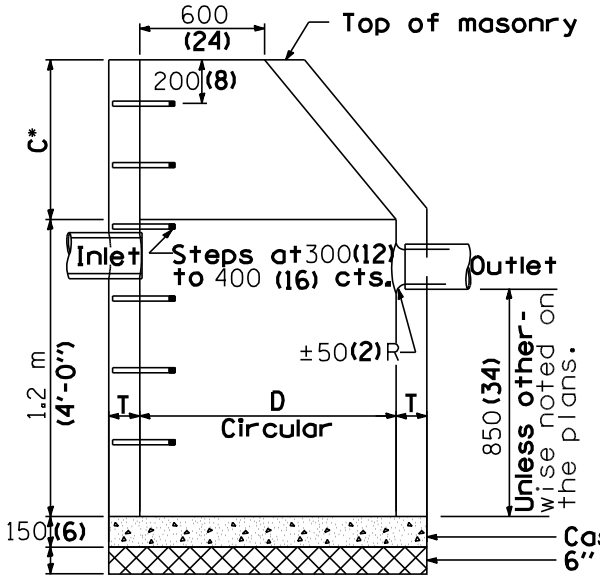
GENERAL NOTES

* This dimension for Precast Reinforced Concrete Sections may vary from the dimension given to plus 150 mm (6").
See Standard 2170 for Optional Precast Reinforced Concrete Flat Slab Top.
All dimensions are in millimeters (inches) unless otherwise shown.

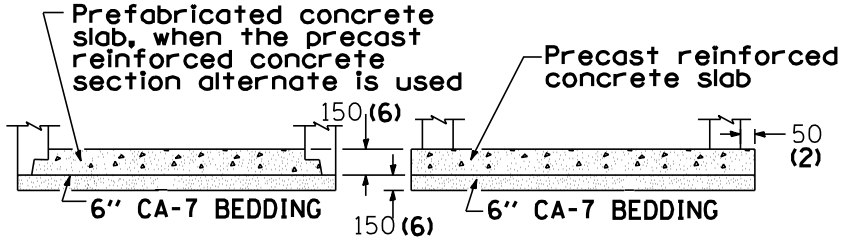
MINOOKA STANDARD

VERSION 1.0

CATCH BASIN – TYPE A



ELEVATION
(Standard Outlet)



ALTERNATE BOTTOM SLAB

MATERIAL FOR WALLS	D	C	T (min.)
Precast Reinforced Concrete Section	(4'-0")	750 (30)	100 (4)
	(5'-0")	1.15 M (3'-9")	125 (5)

GENERAL NOTES

All catch basins shall be 1.2 m (4'-0") in diameter unless otherwise noted on the plans.

* Dimension C for precast reinforced concrete section may vary from the dimension given to plus 150 mm (6").

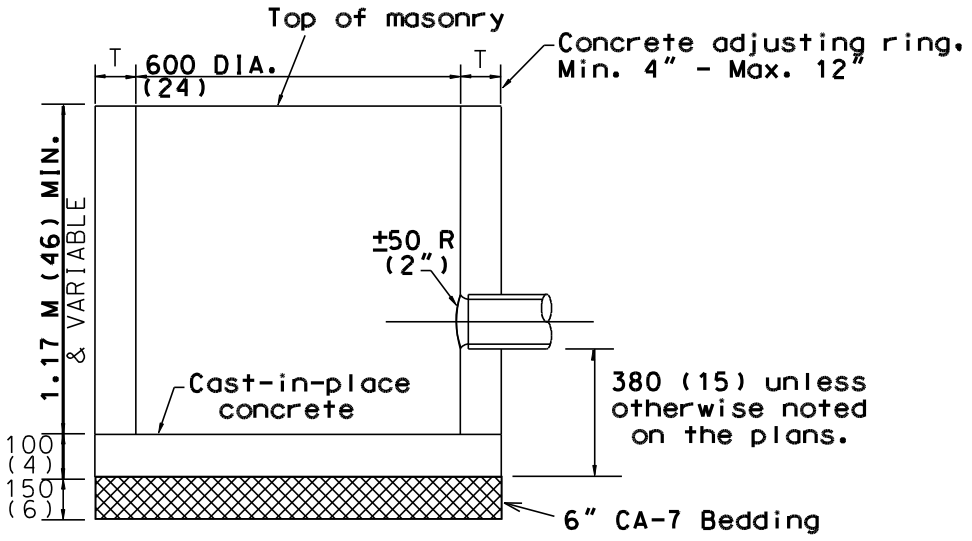
See Standard 2170 for optional precast reinforced concrete flat slab top.

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

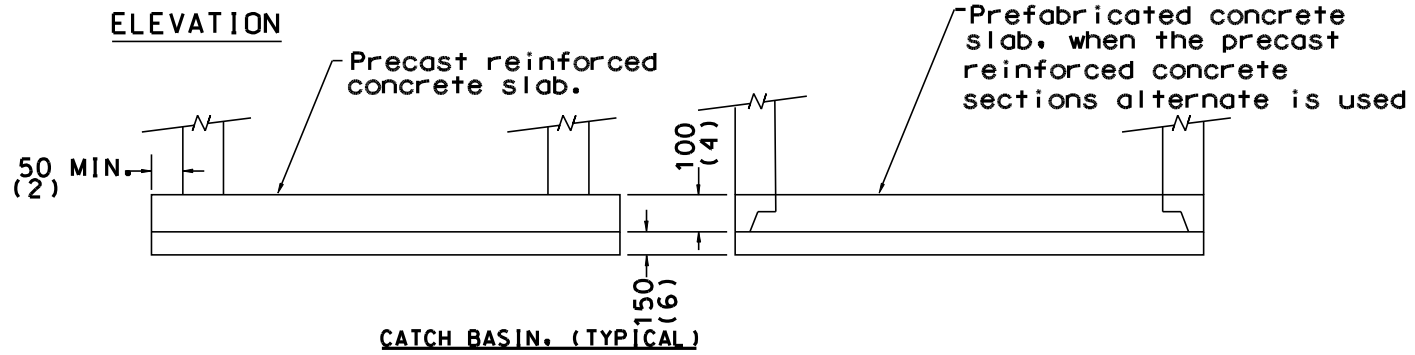
MINOOKA STANDARD

VERSION 1.0

CATCH BASIN – TYPE C



MATERIAL FOR WALLS	T (MIN.)
PRECAST REINFORCED CONCRETE SECTION	75 (3)



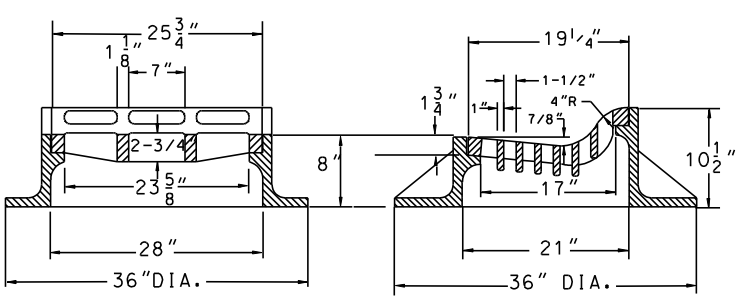
ALTERNATE BOTTOM SLAB

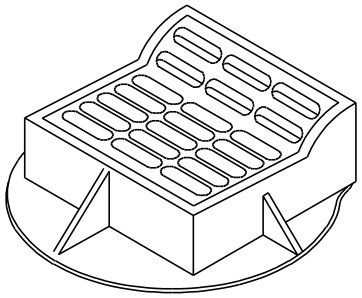
All dimensions are in millimeters (inches) unless otherwise shown.

MINOOKA STANDARD

VERSION 1.0

MOUNTABLE CURB & GUTTER
FRAME & GRATE





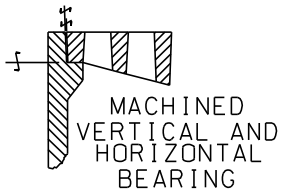
1.) THE FRAME AND GRATE SHALL BE NEENAH R-3501-P OR EJIW 7525 OR APPROVED EQUAL.

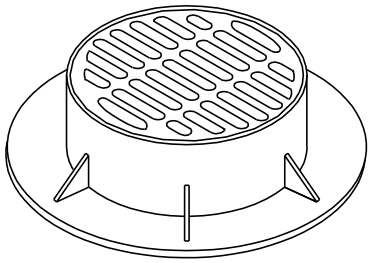
2.) THE FRAME AND GRATE SHALL BE SET ON A MASTIC BED WITH ALL GAPS TUCKPOINTED

MINOOKA STANDARD

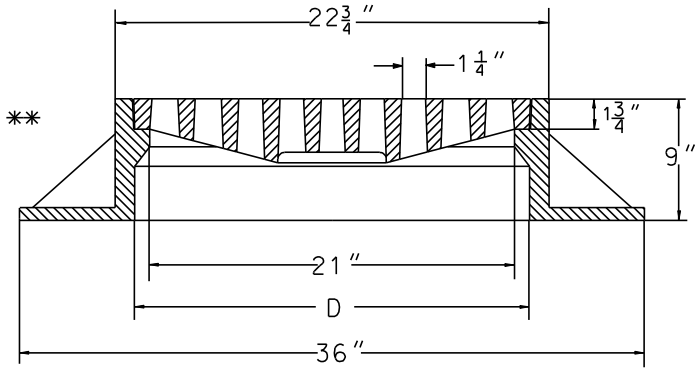
VERSION 1.0

MANHOLE FRAME AND OPEN LID





ILLUSTRATING R-2504-C
WITH TYPE "G" GRATE



1.) THE FRAME AND GRATE SHALL BE NEENAH R-2502
WITH A TYPE D GRATE.
OR EJIW 1022 FRAME WITH TYPE M1 GRATE

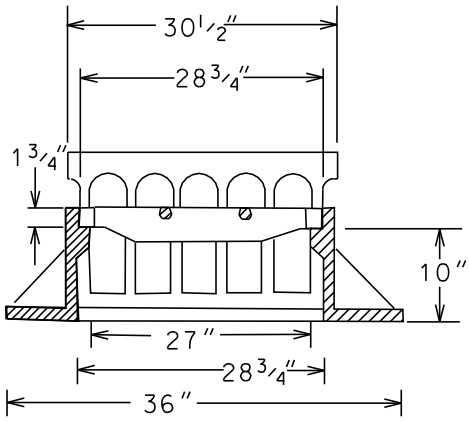
**ALL DIMENSIONS SHOWN ARE FOR THE NEENAH MODELS. EJIW DIMENSIONS MAY VERY.

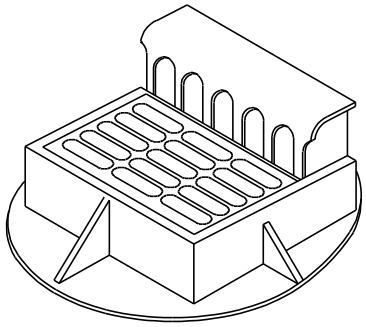
** ALL DIMENSIONS SHOWN ARE FOR THE NEENAH MODELS.
EJIW DIMENSIONS MAY VARY.

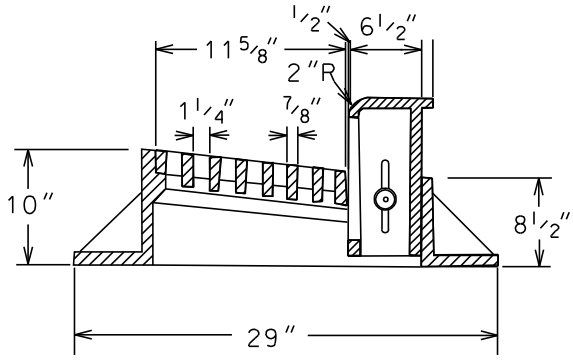
MINOOKA STANDARD

VERSION 1.0

BARRIER CURB & GUTTER FRAME & GRATE







1.) THE FRAME AND GRATE SHALL BE NEENAH R-3281-A WITH TYPE C GRATE OR EJIW 7210 WITH TYPE M1 GRATE AND TYPE T1 BACK OR APPROVED EQUAL.

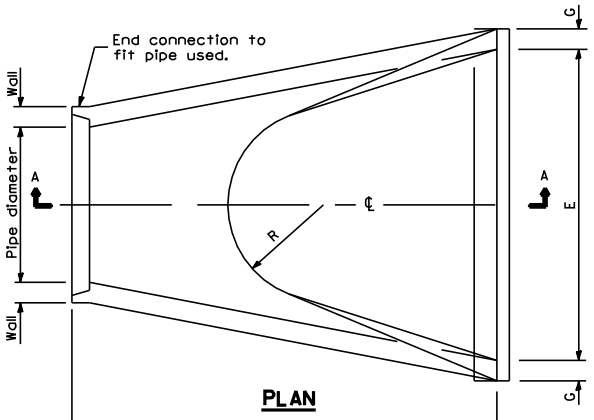
2.) THE FRAME AND GRATE SHALL BE SET ON A MORTAR BED WITH ALL GAPS TUCKPOINTED.

**ALL DIMENSIONS SHOWN ARE FROM THE NEENAH MODELS. EJIW DIMENSIONS MAY VARY.

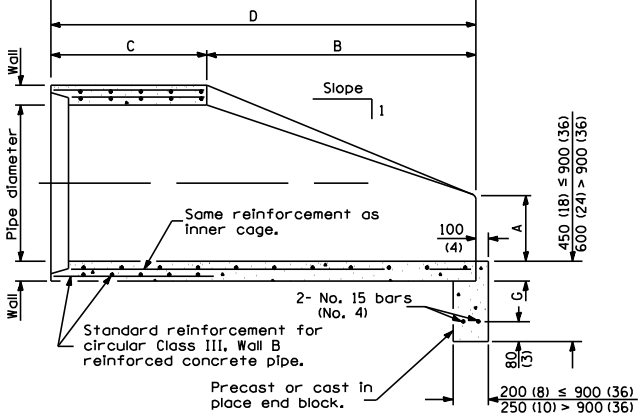
MINOOKA STANDARD

VERSION 1.0

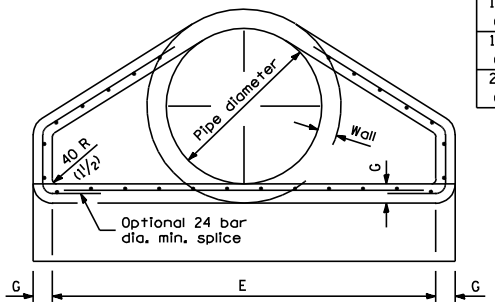
PRECAST REINFORCED CONCRETE FLARED END SECTION



PLAN



SECTION A-A



END VIEW

PIPE DIA.	APPROX. QTY. kg (lbs)	WALL	A	B	C	D	E	G	R	APPROX. SLOPE
300 (12)	240 (530)	51 (2)	102 (4)	610 (24)	1.241 m (4'-0⅞")	1.851 m (6'-0⅞")	610 (24)	51 (2)	229 (9)	1:2.4
375 (15)	335 (740)	57 (2¼)	152 (6)	686 (27)	1.168 m (3'-10")	1.854 m (6'-1")	762 (30)	57 (2¼)	280 (11)	1:2.4
450 (18)	450 (990)	64 (2½)	229 (9)	686 (27)	1.168 m (3'-10")	1.854 m (6'-1")	914 (36)	64 (2½)	305 (12)	1:2.4
525 (21)	580 (1280)	70 (2¾)	229 (9)	889 (35)	965 (38)	1.854 m (6'-1")	1.067 m (3'-6")	70 (2¾)	330 (13)	1:2.4
600 (24)	690 (1520)	76 (3)	241 (9½)	1.105 m (3'-7½")	762 (30)	1.867 m (6'-1½")	1.219 m (4'-0")	76 (3)	356 (14)	1:2.5
675 (27)	875 (1930)	83 (3¼)	267 (10½)	1.219 m (4'-0")	648 (25½)	1.867 m (6'-1½")	1.372 m (4'-6")	83 (3¼)	368 (14½)	1:2.4
750 (30)	995 (2190)	89 (3½)	305 (12)	1.375 m (4'-6")	502 (19¾)	1.874 m (6'-1¾")	1.524 m (5'-0")	89 (3½)	381 (15)	1:2.5
825 (33)	1450 (3200)	95 (3¾)	343 (13½)	1.486 m (4'-10½")	997 (39¼)	2.483 m (8'-1¾")	1.676 m (5'-6")	95 (3¾)	445 (17½)	1:2.5
900 (36)	1860 (4100)	102 (4)	381 (15)	1.6 m (5'-3")	883 (34¾)	2.483 m (8'-1¾")	1.829 m (6'-0")	102 (4)	508 (20)	1:2.5
1050 (42)	2440 (5380)	114 (4½)	533 (21)	1.6 m (5'-3")	889 (35)	2.489 m (8'-2")	1.981 m (6'-6")	114 (4½)	559 (22)	1:2.5
1200 (48)	2970 (6550)	127 (5)	610 (24)	1.829 m (6'-0")	660 (26)	2.489 m (8'-2")	2.134 m (7'-0")	127 (5)	559 (22)	1:2.5
1350 (54)	3740 (8240)	140 (5½)	686 (27)	1.651 m (5'-5")	889 (35)	2.54 m (8'-4")	2.286 m (7'-6")	140 (5½)	610 (24)	1:2.0
1500 (60)	3960 (8730)	152 (6)	889 (35)	1.524 m (5'-0")	991 (39)	2.515 m (8'-3")	2.438 m (8'-0")	127 (5)	*	1:1.9
1650 (66)	4860 (10710)	165 (6½)	762 (30)	1.829 m (6'-0")	686 (27)	2.515 m (8'-3")	2.591 m (8'-6")	140 (5½)	*	1:1.7
1800 (72)	5680 (12520)	178 (7)	914 (36)	1.981 m (6'-6")	533 (21)	2.514 m (8'-3")	2.743 m (9'-0")	152 (6)	*	1:1.8
1950 (78)	6700 (14770)	191 (7½)	914 (36)	2.286 m (7'-6")	533 (21)	2.819 m (9'-3")	2.896 m (9'-6")	165 (6½)	*	1:1.8
2100 (84)	8240 (18160)	203 (8)	914 (36)	2.299 m (7'-6½")	533 (21)	2.832 m (9'-3½")	3.048 m (10'-0")	165 (6½)	*	1:1.6

* Radius as furnished by manufacturer

GENERAL NOTES

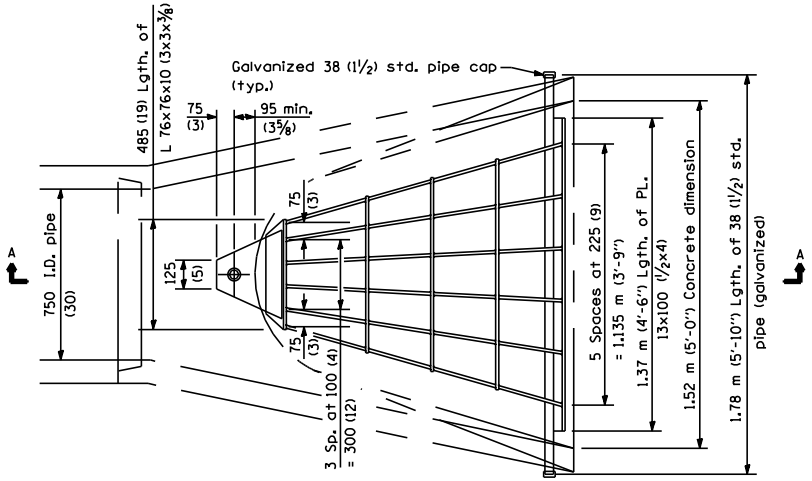
All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V:H).

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

MINOOKA STANDARD

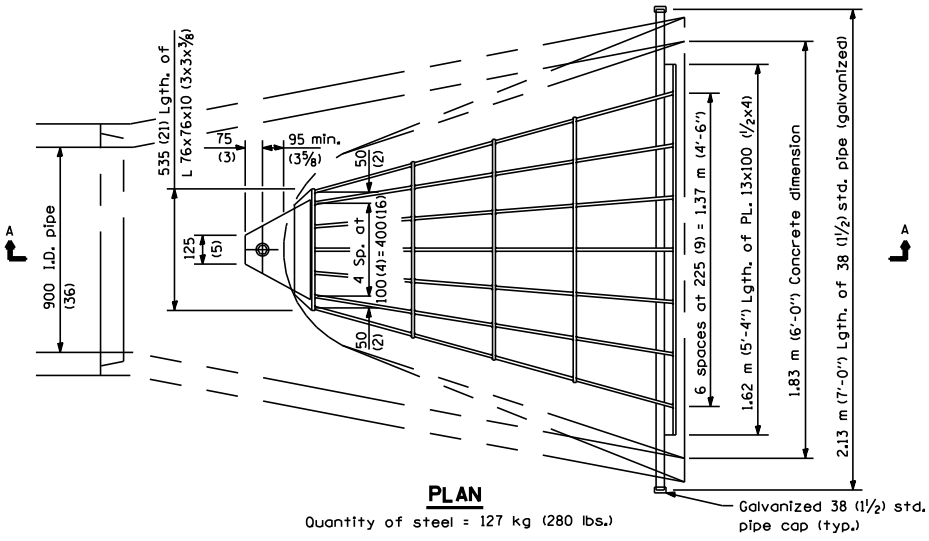
VERSION 1.0

GRATING FOR CONCRETE FLARED END SECTION



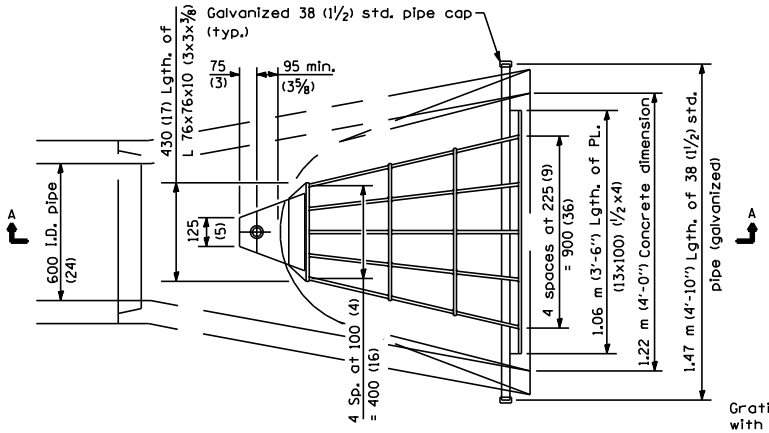
PLAN

Quantity of steel = 95 kg (210 lbs.)



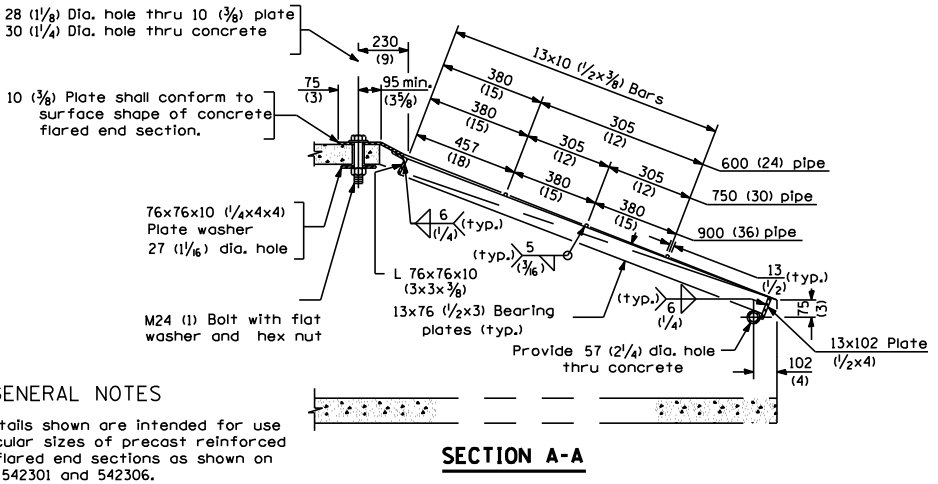
PLAN

Quantity of steel = 127 kg (280 lbs.)



PLAN

Quantity of steel = 68 kg (150 lbs.)



SECTION A-A

GENERAL NOTES

Grating details shown are intended for use with particular sizes of precast reinforced concrete flared end sections as shown on standards 542301 and 542306.

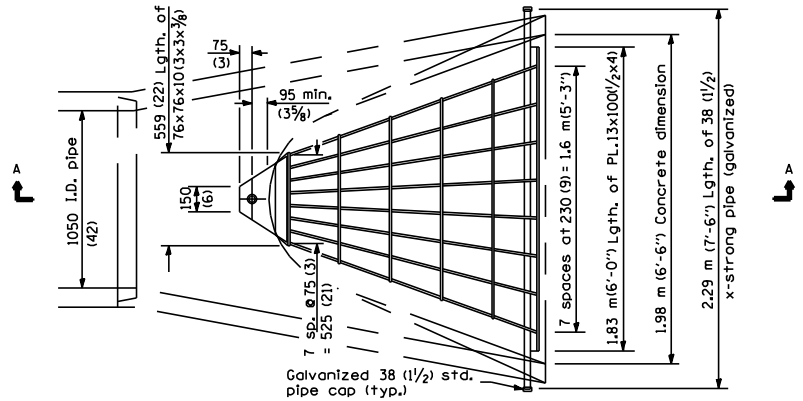
Approximate quantity of steel shown includes total quantity of grating, bolts, nuts, washers and steel pipe.

Holes in the precast concrete flared end sections shall be cored to the diameters noted. If cone-out on the other end of the hole occurs, the hole shall be filled with grout to correct the diameter of the hole.

MINOOKA STANDARD

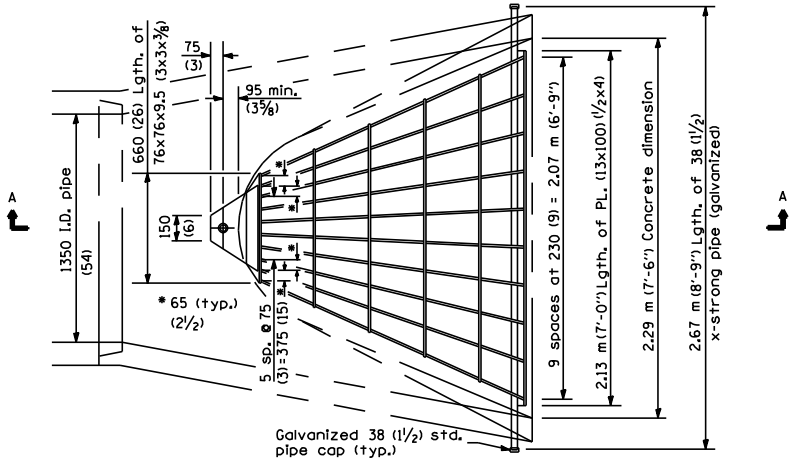
VERSION 1.0

GRATING FOR CONCRETE FLARED END SECTION



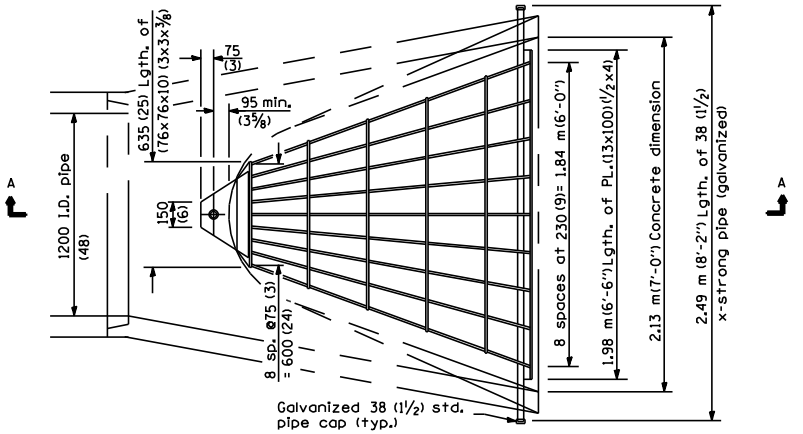
PLAN

Quantity of steel = 145 kg (320 lbs.)



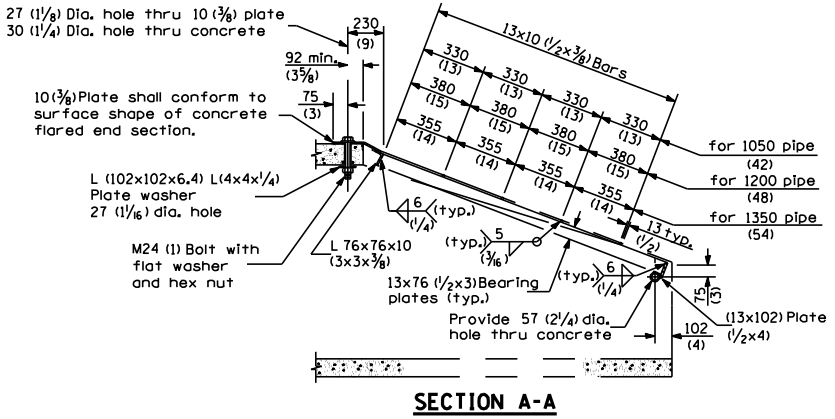
PLAN

Quantity of steel =193 kg (425 lbs.)



PLAN

Quantity of steel = 181 kg (400 lbs.)

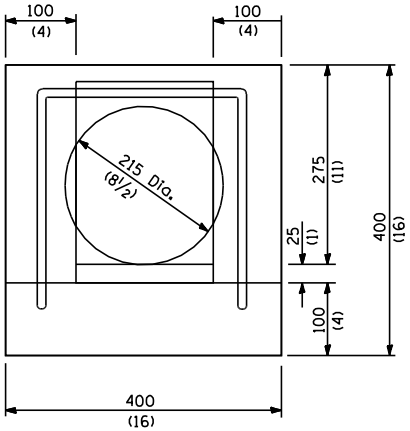


SECTION A-A

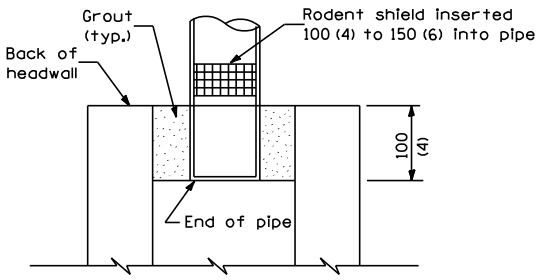
MINOOKA STANDARD

VERSION 1.0

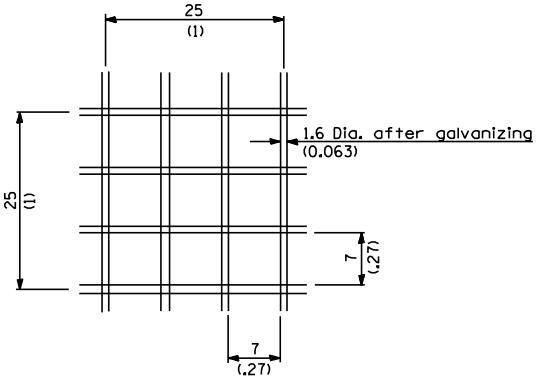
GRATING FOR CONCRETE FLARED END SECTION



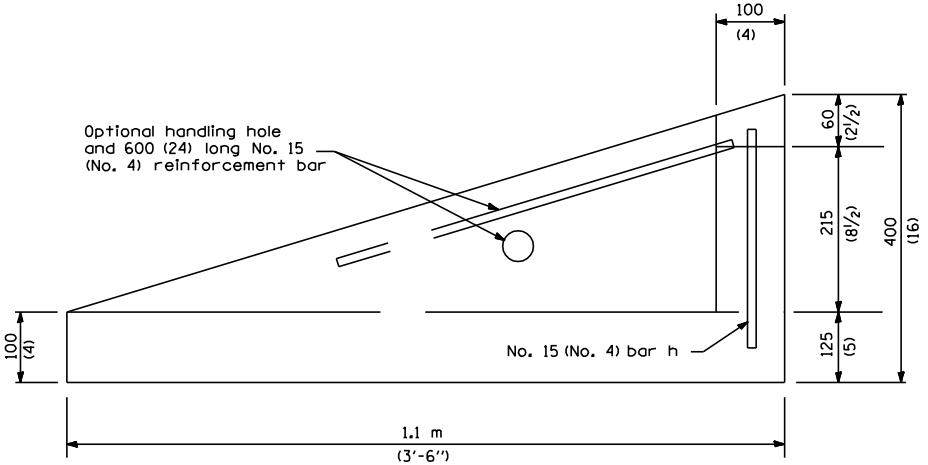
FRONT VIEW



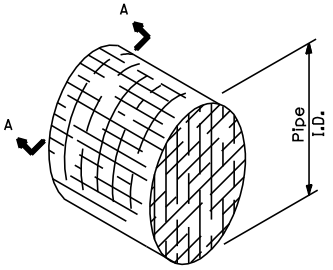
RODENT SHIELD PLACEMENT



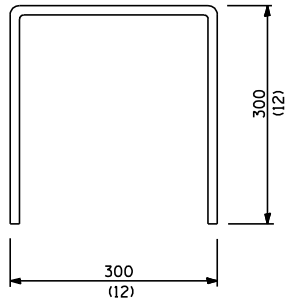
SECTION A-A



SIDE VIEW



DETAIL OF RODENT SHIELD



BAR h

MINOOKA STANDARD

VERSION 1.0

LOW FLOW CHANNEL

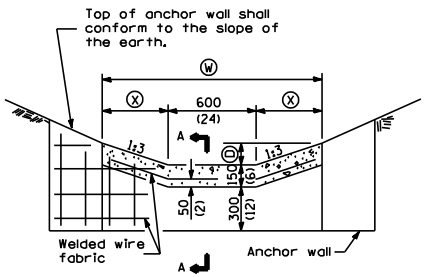


TABLE FOR PAVED DITCH TYPE A

TYPE	Ⓓ	Ⓦ	Ⓧ	Flow Area m^2 (sq. ft.)	Conc Area m^2 (sq. yd.)
A-15	150 (6)	1.5 m (5'-0")	450 (18)	.157 (1.75)	.225 (0.278)
A-22	225 (9)	1.95 m (6'-6")	675 (27)	.287 (3.19)	.293 (0.361)
A-30	300 (12)	2.4 m (8'-0")	900 (36)	.450 (5.00)	.360 (0.444)
A-37	375 (15)	2.85 m (9'-6")	1.12 m (3'-9")	.645 (7.19)	.426 (0.528)
A-45	450 (18)	3.3 m (11'-0")	1.35 m (4'-6")	.877 (9.75)	.495 (0.611)
A-52	525 (21)	3.75 m (12'-6")	1.58 m (5'-3")	1.144 (12.69)	.564 (0.694)
A-60	600 (24)	4.2 m (14'-0")	1.8 m (6'-0")	1.440 (16.00)	.630 (0.778)

PAVED DITCH TYPE A

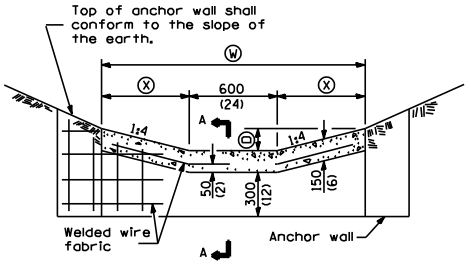
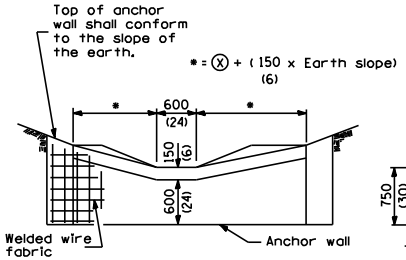
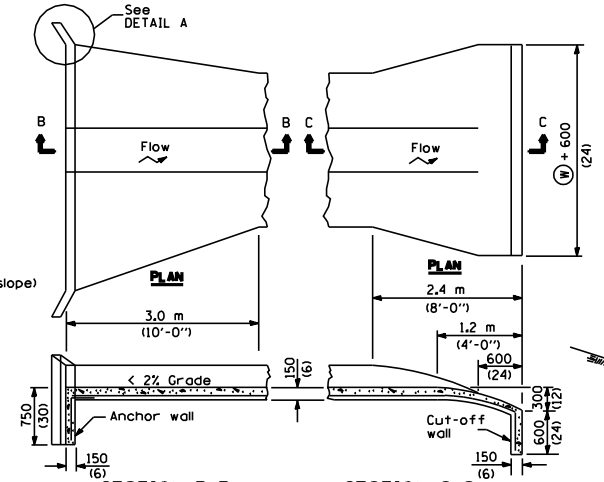


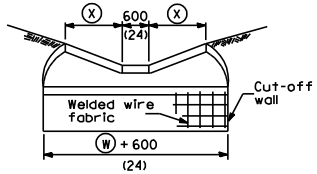
TABLE FOR PAVED DITCH TYPE B

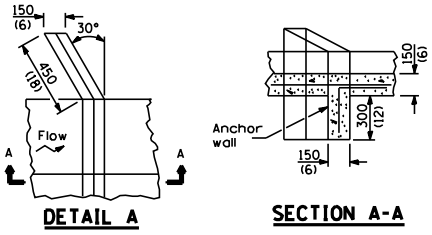
TYPE	Ⓓ	Ⓦ	Ⓧ	Flow Area m^2 (sq. ft.)	Conc Area m^2 (sq. yd.)
B-15	150 (6)	1.8 m (6'-0")	600 (24)	.180 (2.00)	.270 (0.333)
B-22	225 (9)	2.4 m (8'-0")	900 (36)	.337 (3.75)	.360 (0.444)
B-30	300 (12)	3.0 m (10'-0")	1.2 m (4'-0")	.540 (6.00)	.450 (0.555)
B-37	375 (15)	3.6 m (12'-0")	1.5 m (5'-0")	.787 (8.75)	.540 (0.667)
B-45	450 (18)	4.2 m (14'-0")	1.8 m (6'-0")	1.080 (12.00)	.630 (0.778)
B-52	525 (21)	4.8 m (16'-0")	2.1 m (7'-0")	1.417 (15.75)	.720 (0.889)
B-60	600 (24)	5.4 m (18'-0")	2.4 m (8'-0")	1.800 (20.00)	.810 (1.000)

PAVED DITCH TYPE B





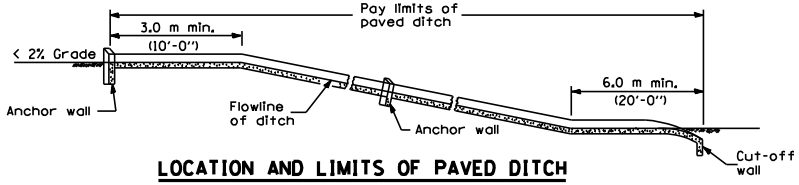




DETAIL OF ANCHOR WALL

DETAIL OF UPSTREAM END

DETAIL OF DOWNSTREAM END



LOCATION AND LIMITS OF PAVED DITCH

GENERAL NOTES

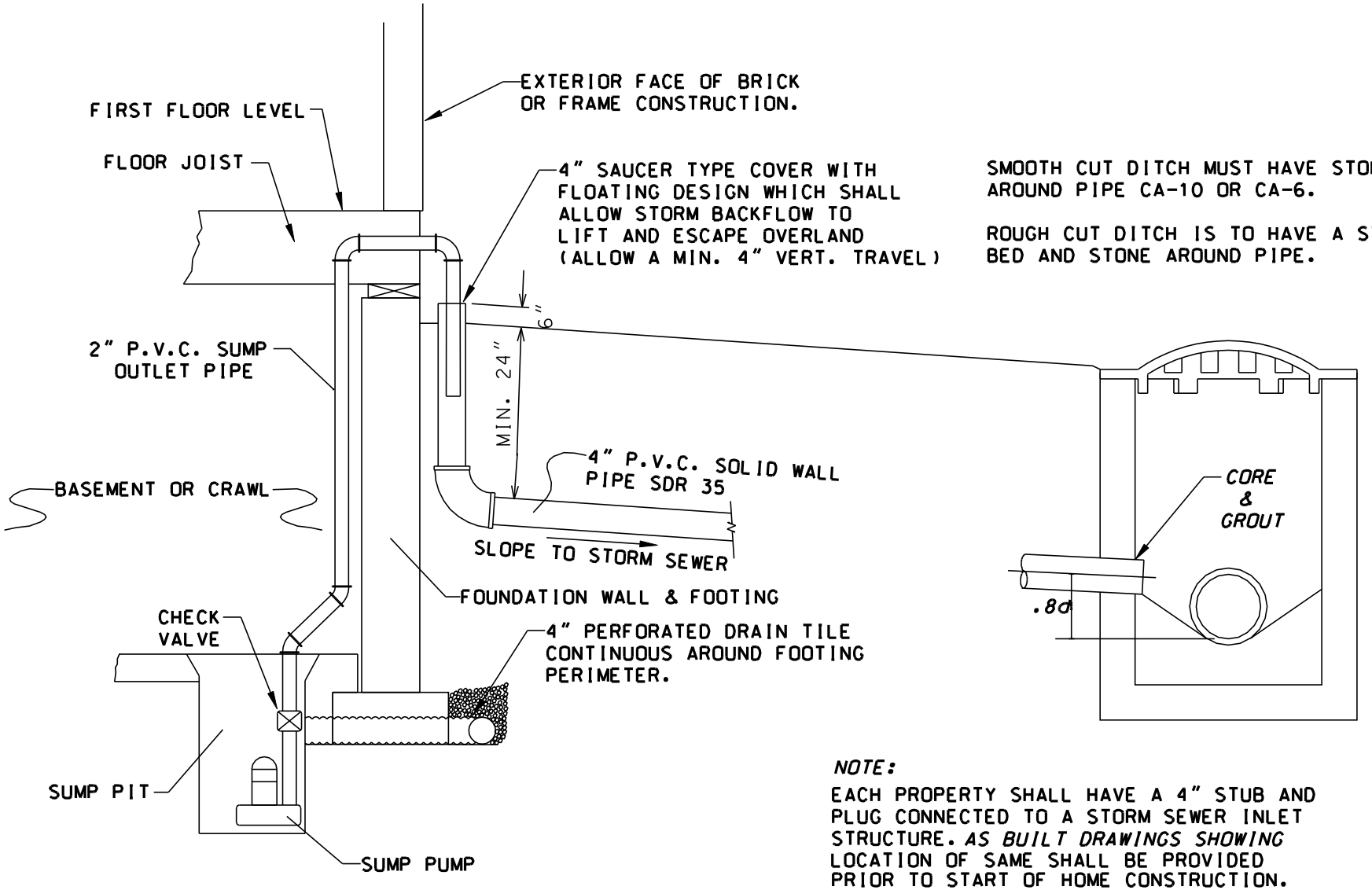
All slopes are expressed as of vertical displacement to units of horizontal displacement (V:H).

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

MINOOKA STANDARD

VERSION 1.0

TYPICAL SUMP PUMP CONNECTION AT HOUSE



SMOOTH CUT DITCH MUST HAVE STONE AROUND PIPE CA-10 OR CA-6.

ROUGH CUT DITCH IS TO HAVE A STONE BED AND STONE AROUND PIPE.

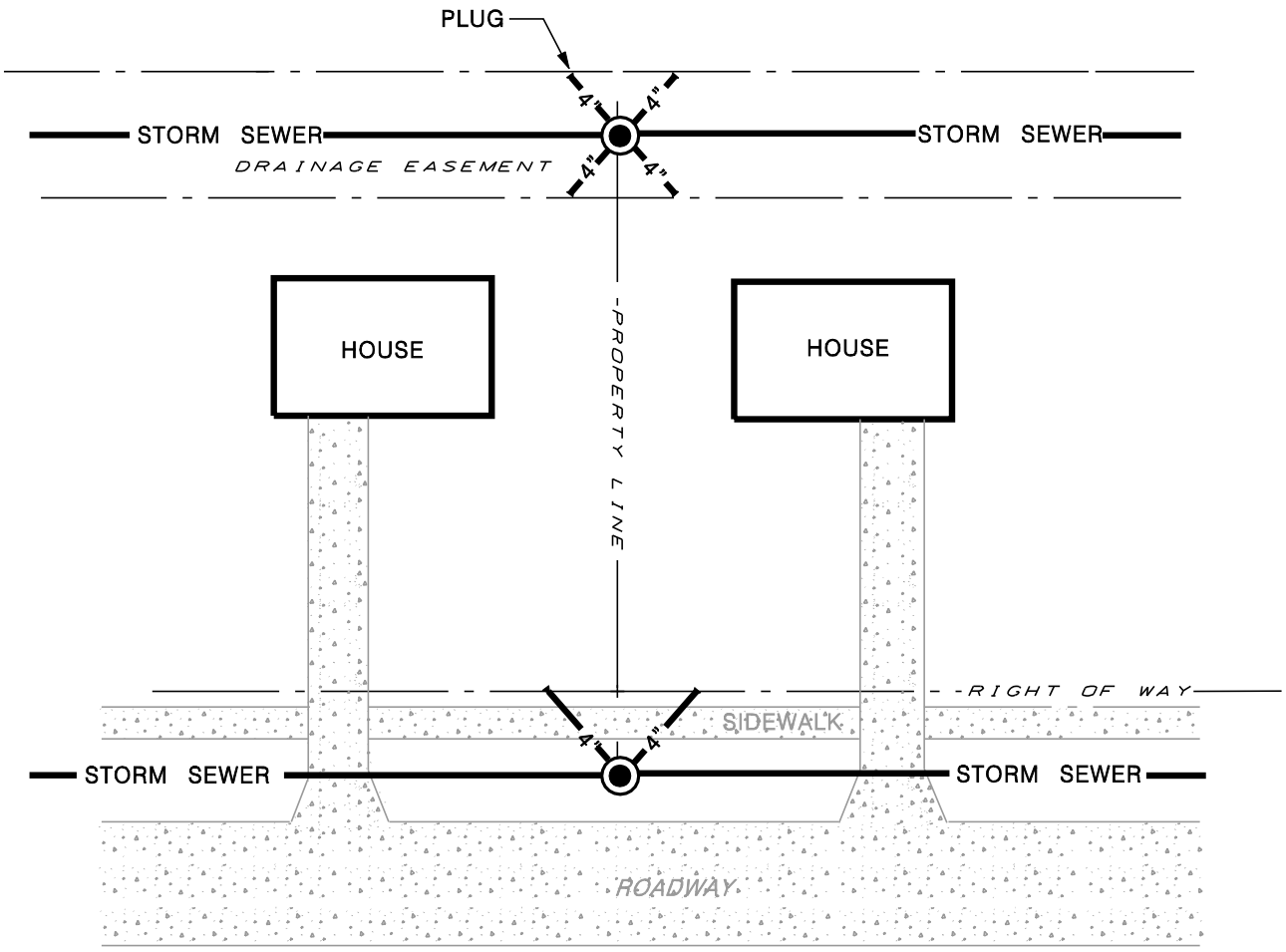
NOTE:

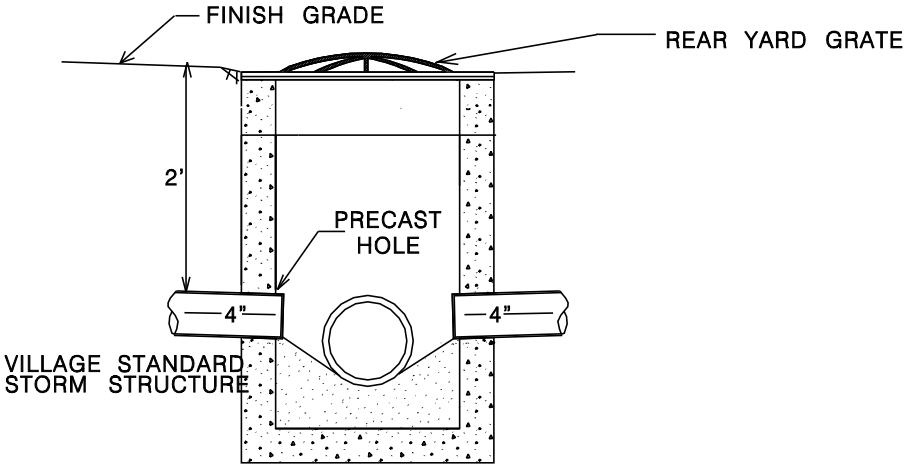
EACH PROPERTY SHALL HAVE A 4" STUB AND PLUG CONNECTED TO A STORM SEWER INLET STRUCTURE. *AS BUILT DRAWINGS SHOWING* LOCATION OF SAME SHALL BE PROVIDED PRIOR TO START OF HOME CONSTRUCTION.

MINOOKA STANDARD

VERSION 1.0

TYPICAL SUMP PUMP CONNECTION TO STORM SEWER





MINOOKA STANDARD

VERSION 1.0