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

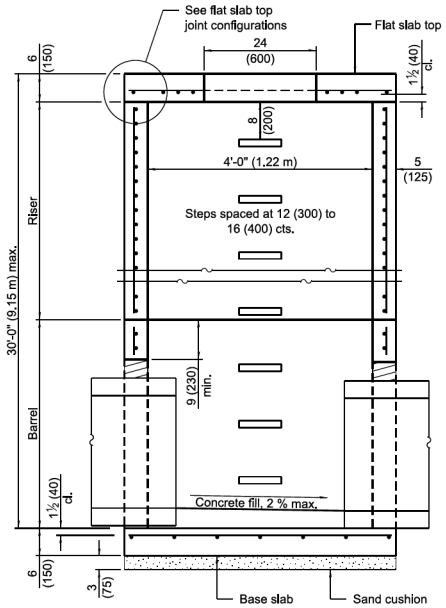
- For three inch (3") residential subdivision roll curbs a NEENAH R-3501-P or EAST JORDAN IRON WORKS 7525 frame and grate is required.

Barrier Curb Inlet Frame & Grate

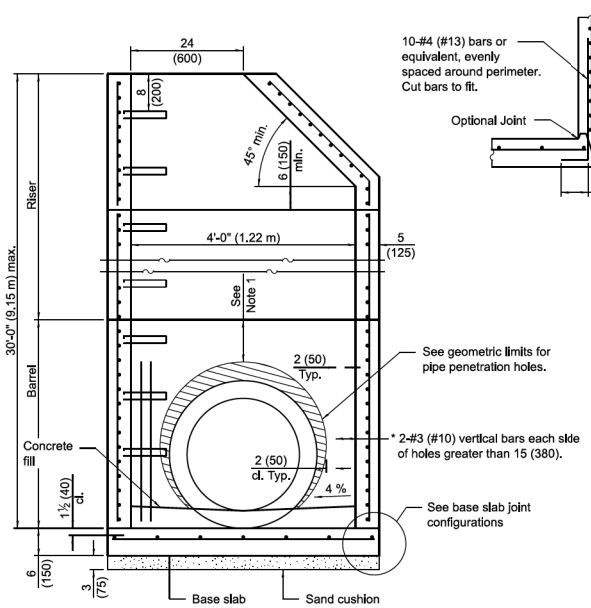
- For six inch (6") barrier curb a NEENAH R-3278-A type C grate or EAST JORDAN IRON WORKS frame 7210 with a type MI grate and type T1 back.

STORM MANHOLE
TYPE A – 4′ DIAMETER

IDOT
STANDARD 602401

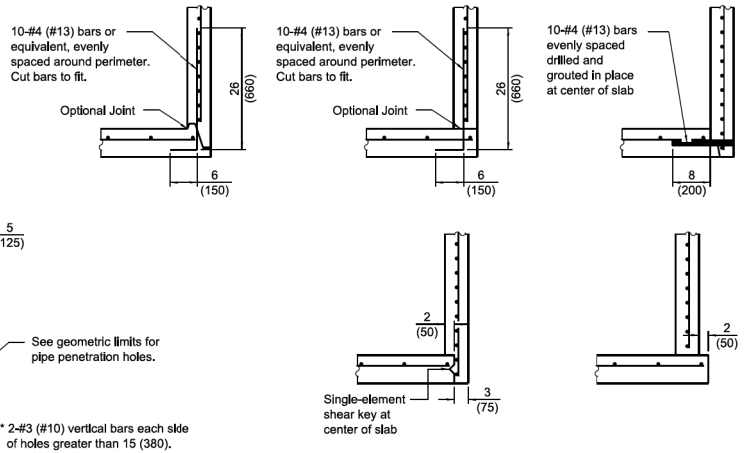


SECTION PARALLEL TO PIPE
(Without conical top riser)

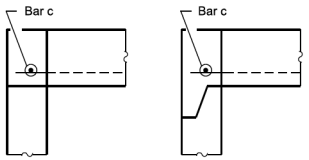


SECTION PERPENDICULAR TO PIPE
(With conical top riser)

* As an alternate, the barrel wall reinforcement may be reduced to riser wall reinforcement with #3 (#10) bars placed around the pipe penetration holes as shown. This option may be utilized when the pipe penetration holes are formed as opposed to cored.



BASE SLAB JOINT CONFIGURATIONS



FLAT SLAB TOP JOINT CONFIGURATIONS
(Shown at access hole)

GEOMETRIC LIMITS FOR PIPE PENETRATION HOLES

Note 1: A minimum of 9 (230) of monolithic reinforced concrete shall be maintained above pipe penetration holes > 24 (600).

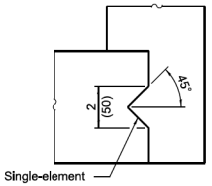
Note 2: A minimum 12 (300) inside arc length of reinforced concrete shall be maintained between pipe penetration holes > 15 (380).

Note 3: A maximum of 60 percent of the inside perimeter of the reinforced concrete manhole walls may be removed.

Note 4: Horizontal joints that intersect pipe penetration holes > 15 (380) shall have one joint splice for every location around the perimeter of the joint where the inside arc length between pipe penetration holes is < 24 (600). See joint splice detail.

Note 5: The recommended pipe penetration hole is equal to the O.D. of the pipe plus 4 (100).

Note 6: Only pipe penetration holes ≤ 15 (380) are allowed in riser sections.



SHEAR KEY GEOMETRY
(Reinforcement not shown for clarity)

GENERAL NOTES

The manufacturer shall ensure that all precast manhole sections are additionally reinforced where required to resist damage from handling, shipping and installation stresses.

Lifting holes shall be located in the sections as per the manufacturer's recommendations.

See Standard 602701 for details of manhole steps.

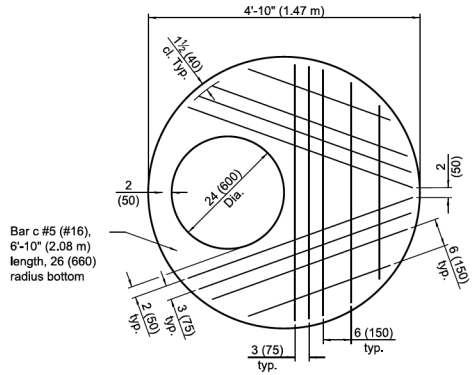
All dimensions are in inches (millimeters) unless otherwise noted.

MINOOKA STANDARD

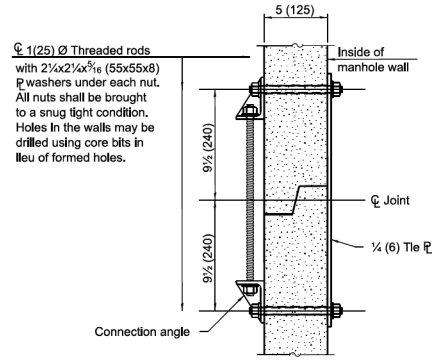
REV. NOV 2025

STORM MANHOLE
TYPE A – 4' DIAMETER

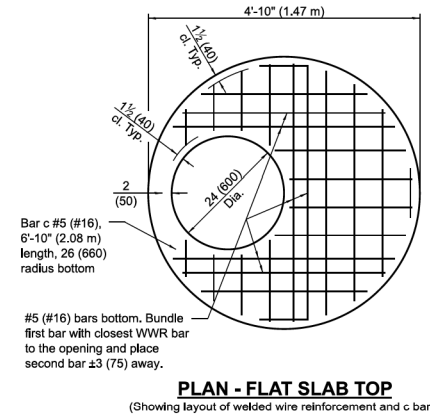
IDOT
STANDARD 602401



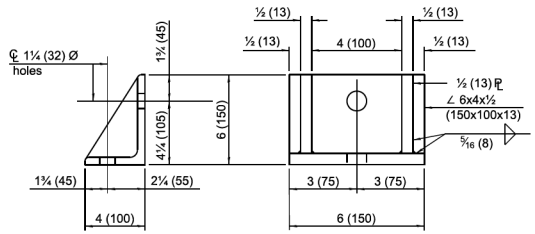
PLAN - FLAT SLAB TOP
(Showing layout of reinforcement bars and c bars)



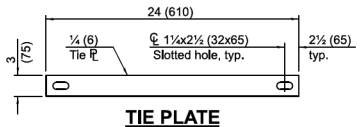
JOINT SPLICE



PLAN - FLAT SLAB TOP
(Showing layout of welded wire reinforcement and c bars)



CONNECTION ANGLE



TIE PLATE

FLAT SLAB TOP REINFORCEMENT

Location	WWR (each direction)		Rebar		
	A_s(min.)	Spacing (max.)	A_s(min.)	Spacing (max.)	Bar Size
Bottom Mat	** 0.62 sq. in./ft. (1312 sq. mm/m)	6 (150)	See plan view for rebar orientation and spacing and this table for bar size		#5 (#16)

** Only one layer of WWR permitted to avoid congestion.

WALL REINFORCEMENT

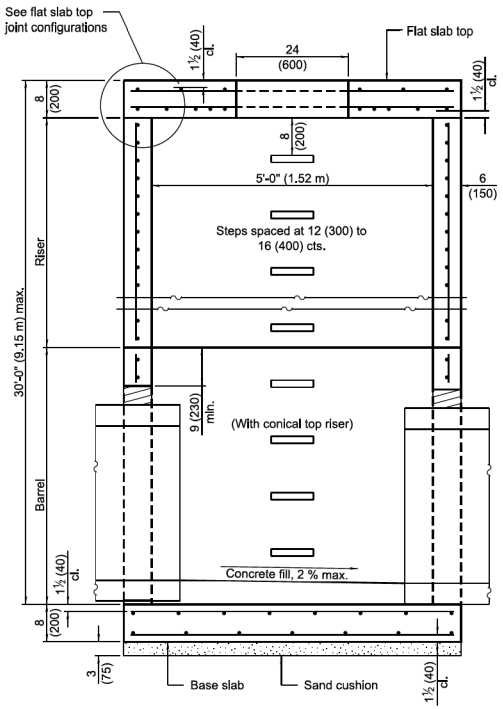
Location	Orientation	WWR or Rebar	
		A_s(min.)	Spacing (max.)
Riser	Circumferential	0.12 sq. in./ft. (254 sq. mm/m)	6 (150)
	Vertical	0.045 sq. in./ft. (95 sq. mm/m)	8 (200)
Barrel	Circumferential	0.12 sq. in./ft. (254 sq. mm/m)	6 (150)
	Vertical	0.16 sq. in./ft. (339 sq. mm/m)	4 (100)

BASE SLAB REINFORCEMENT

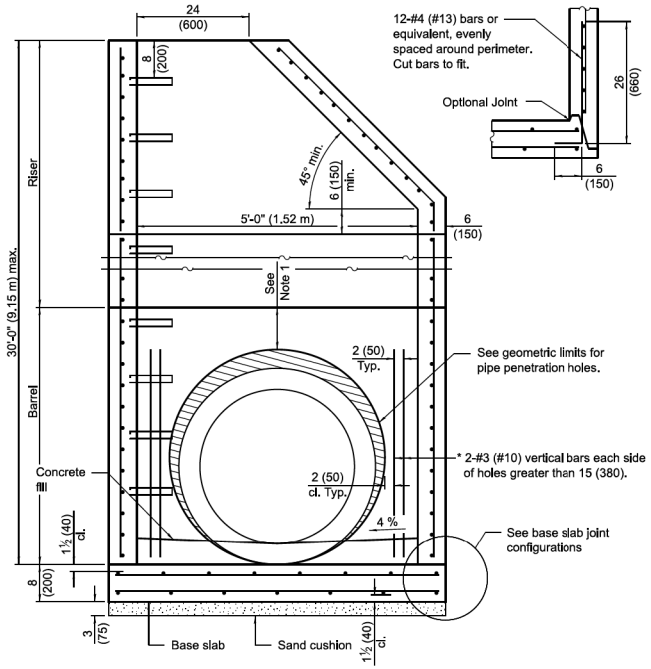
Location	Total Height	WWR or Rebar (each direction)	
		A_s(min.)	Spacing (max.)
Top Mat	≤ 20 ft. (6.10 m)	0.24 sq. in./ft. (508 sq. mm/m)	10 (250)
	> 20 ft. (6.10 m)	0.24 sq. in./ft. (508 sq. mm/m)	10 (250)

STORM MANHOLE
TYPE A – 5′ DIAMETER

IDOT
STANDARD 602402

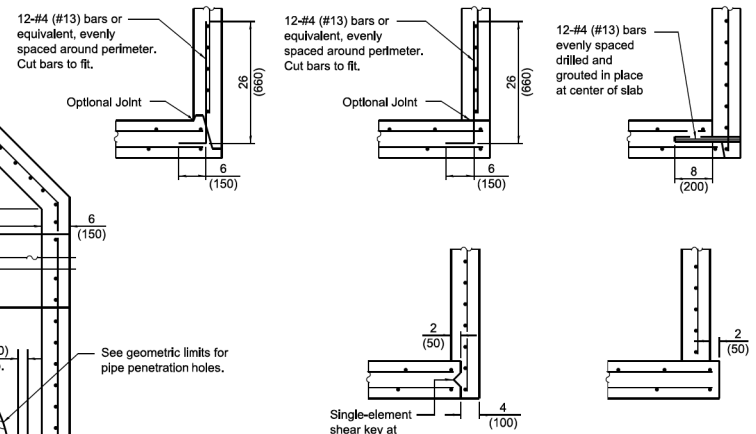


SECTION PARALLEL TO PIPE
(Without conical top riser)

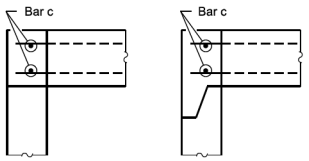


SECTION PERPENDICULAR TO PIPE
(With conical top riser)

* As an alternate, the barrel wall reinforcement may be reduced to riser wall reinforcement with #3 (#10) bars placed around the pipe penetration holes as shown. This option may be utilized when the pipe penetration holes are formed as opposed to cored.



BASE SLAB JOINT CONFIGURATIONS



FLAT SLAB TOP JOINT CONFIGURATIONS
(Shown at access hole)

GEOMETRIC LIMITS FOR PIPE PENETRATION HOLES

Note 1: A minimum of 9 (230) of monolithic reinforced concrete shall be maintained above pipe penetration holes > 32 (810).

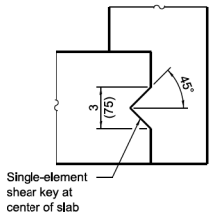
Note 2: A minimum 12 (300) inside arc length of reinforced concrete shall be maintained between pipe penetration holes > 15 (380).

Note 3: A maximum of 60 percent of the inside perimeter of the reinforced concrete manhole walls may be removed.

Note 4: Horizontal joints that intersect pipe penetration holes > 15 (380) shall have one joint splice for every location around the perimeter of the joint where the inside arc length between pipe penetration holes is < 24 (600). See joint splice detail.

Note 5: The recommended pipe penetration hole is equal to the O.D. of the pipe plus 4 (100).

Note 6: Only pipe penetration holes ≤ 15 (380) are allowed in riser sections.



SHEAR KEY GEOMETRY
(Reinforcement not shown for clarity)

GENERAL NOTES

The manufacturer shall ensure that all precast manhole sections are additionally reinforced where required to resist damage from handling, shipping and installation stresses.

Lifting holes shall be located in the sections as per the manufacturer's recommendations.

See Standard 602701 for details of manhole steps.

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

MINOOKA STANDARD

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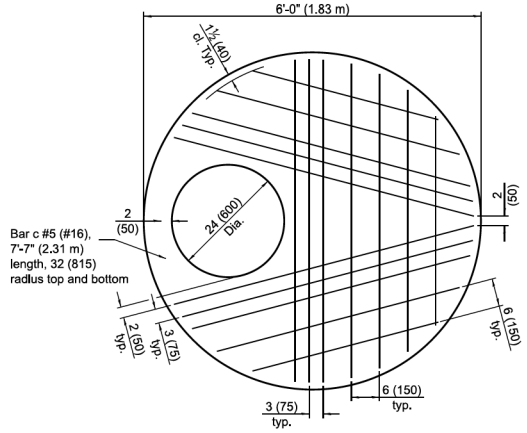
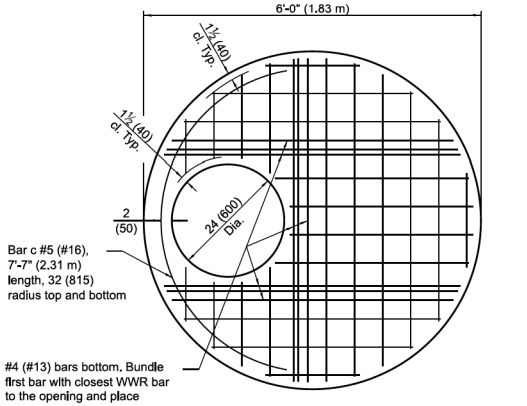
STORM MANHOLE
TYPE A – 5′ DIAMETER

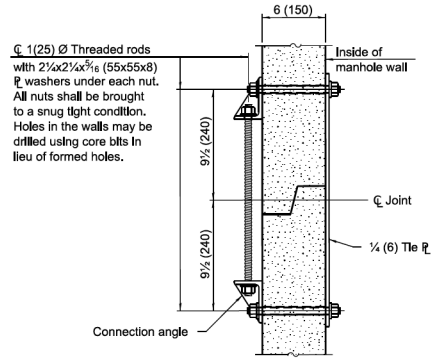
IDOT
STANDARD 602402



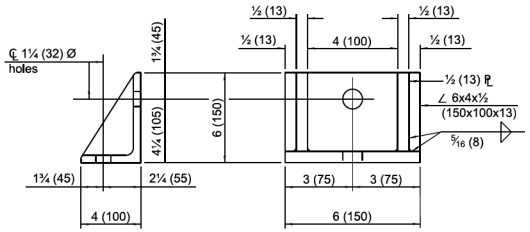
PLAN - FLAT SLAB TOP
(Showing layout of bottom reinforcement bars and c bars)



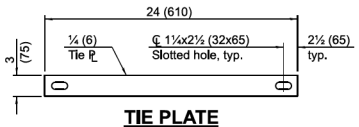
PLAN - FLAT SLAB TOP
(Showing layout of welded wire reinforcement and c bars)



JOINT SPLICE



CONNECTION ANGLE



TIE PLATE

FLAT SLAB TOP REINFORCEMENT

Location	WWR (each direction)		Rebar (each direction except as noted)		
	A_S(min.)	Spacing (max.)	A_S(min.)	Spacing (max.)	Bar Size
Top Mat	0.11 sq. in./ft. (233 sq. mm/m)	18 (450)	0.11 sq. in./ft. (233 sq. mm/m)	18 (450)	#3 or #4 (#10) (#13)
Bottom Mat	** 0.40 sq. in./ft. (847 sq. mm/m)	6 (150)	See plan view for rebar orientation and spacing and this table for bar size		#4 (#13)

** Only one layer of WWR permitted to avoid congestion.

WALL REINFORCEMENT

Location	Orientation	WWR or Rebar	
		A_S(min.)	Spacing (max.)
Riser	Circumferential	0.15 sq. in./ft. (318 sq. mm/m)	6 (150)
	Vertical	0.045 sq. in./ft. (95 sq. mm/m)	8 (200)
Barrel	Circumferential	0.15 sq. in./ft. (318 sq. mm/m)	6 (150)
	Vertical	0.16 sq. in./ft. (339 sq. mm/m)	4 (100)

BASE SLAB REINFORCEMENT

Location	Total Height	WWR or Rebar (each direction)	
		A_S(min.)	Spacing (max.)
Top Mat	≤ 20 ft. (6.10 m)	0.24 sq. in./ft. (508 sq. mm/m)	10 (250)
	> 20 ft. (6.10 m)	0.28 sq. in./ft. (593 sq. mm/m)	8 (200)
Bottom Mat	All	0.11 sq. in./ft. (233 sq. mm/m)	18 (450)

MINOOKA STANDARD

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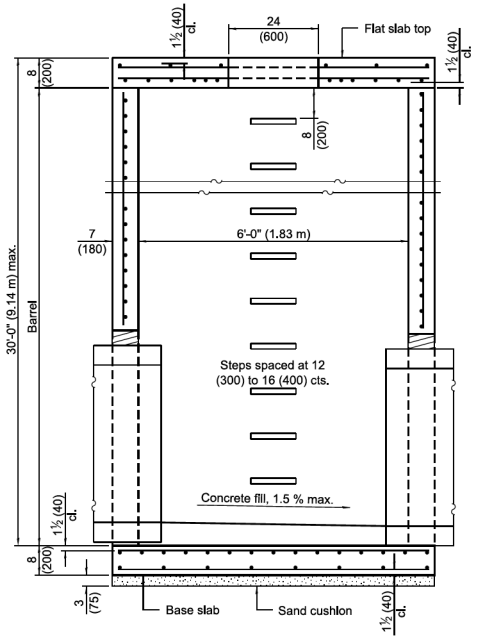
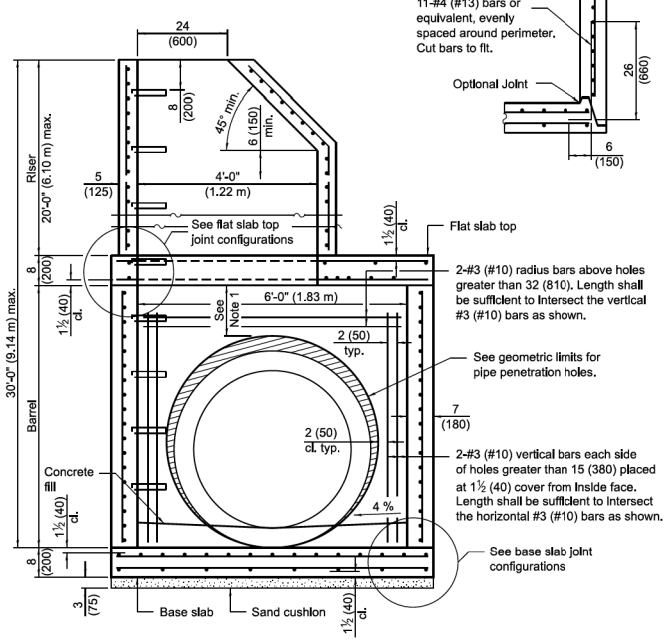
STORM MANHOLE
TYPE A – 6' DIAMETER

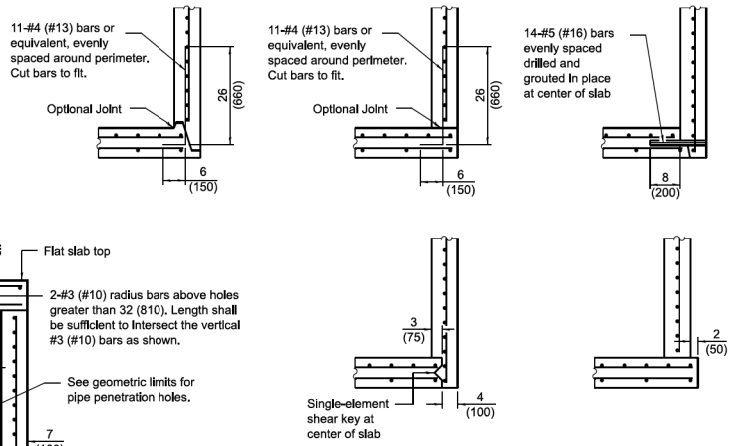
IDOT STANDARD 602406



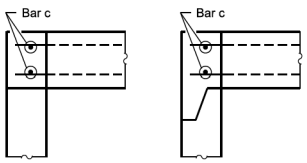
SECTION PARALLEL TO PIPE
(Without conical top riser)



SECTION PERPENDICULAR TO PIPE
(With conical top riser)



BASE SLAB JOINT CONFIGURATIONS



FLAT SLAB TOP JOINT CONFIGURATIONS
(Shown at access hole)

GEOMETRIC LIMITS FOR PIPE PENETRATION HOLES

Note 1: A minimum of 9 (230) of monolithic reinforced concrete shall be maintained above pipe penetration holes > 32 (810).

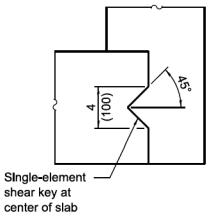
Note 2: A minimum 12 (300) inside arc length of reinforced concrete shall be maintained between pipe penetration holes > 15 (380).

Note 3: A maximum of 60 percent of the inside perimeter of the reinforced concrete manhole walls may be removed.

Note 4: Horizontal joints that intersect pipe penetration holes > 15 (380) shall have one joint splice for every location around the perimeter of the joint where the inside arc length between pipe penetration holes is < 24 (600). See joint splice detail.

Note 5: The recommended pipe penetration hole is equal to the O.D. of the pipe plus 4 (100).

Note 6: Only pipe penetration holes ≤ 15 (380) are allowed in riser sections.



SHEAR KEY GEOMETRY
(Reinforcement not shown for clarity)

GENERAL NOTES

Pipe holes shall be formed to facilitate proper placement of hole reinforcement.

The manufacturer shall ensure that all precast manhole sections are additionally reinforced where required to resist damage from handling, shipping and installation stresses.

Lifting holes shall be located in the sections as per the manufacturer's recommendations.

See Standard 602701 for details of manhole steps.

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

MINOOKA STANDARD

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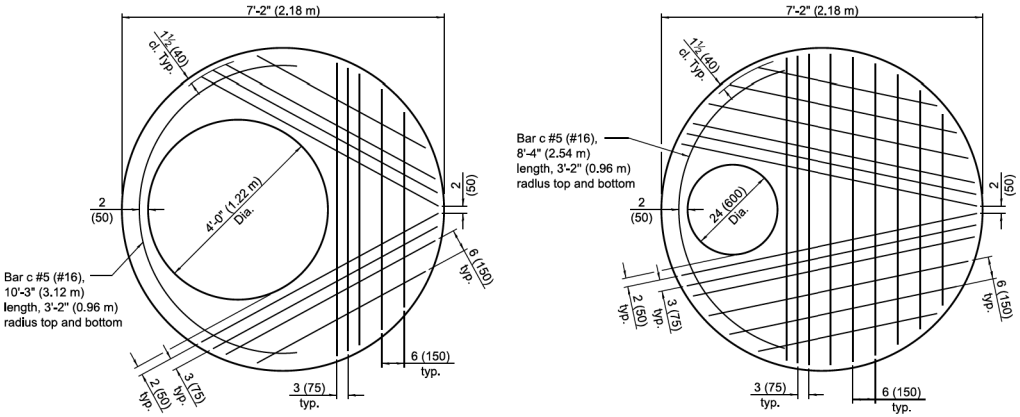
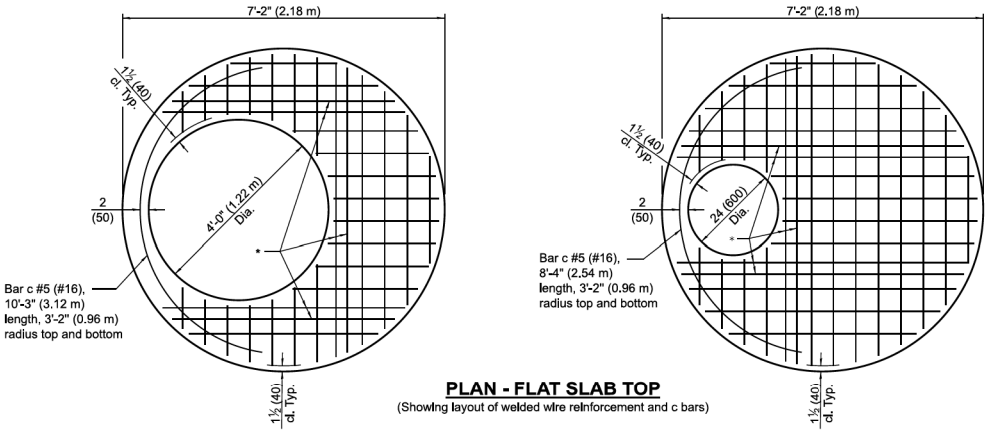
STORM MANHOLE
TYPE A – 6′ DIAMETER

IDOT
STANDARD 602406



PLAN - FLAT SLAB TOP
(Showing layout of bottom reinforcement bars and c bars)

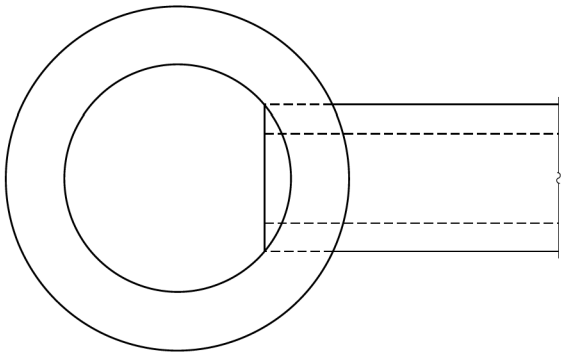


PLAN - FLAT SLAB TOP
(Showing layout of welded wire reinforcement and c bars)

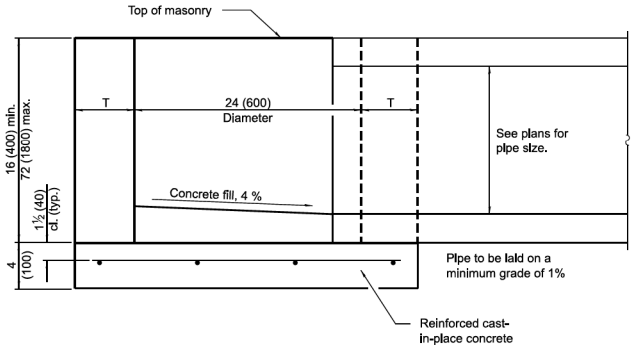
* #5 (#16) bars for risers ≤ 10 ft. (3.05 m) tall or #6 (#19) bars for risers > 10 ft. (3.05 m) tall bottom. Bundle first bar with closest WWR bar to the opening and place second bar ±3 (75) away.

INLET – TYPE A

IDOT STANDARD 602301

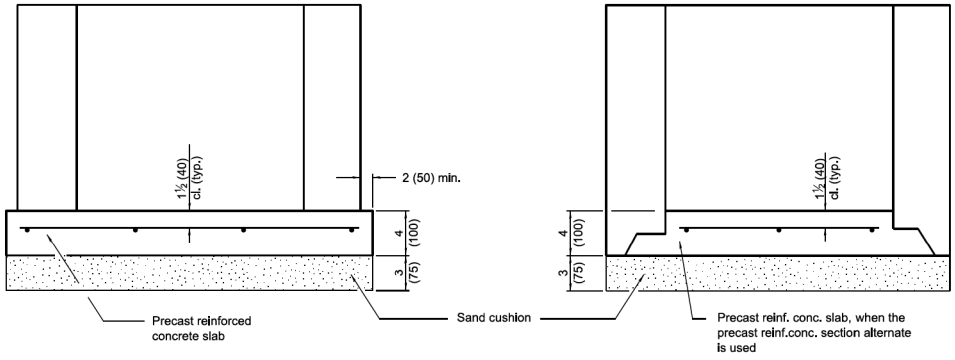


PLAN



ELEVATION

ALTERNATE MATERIALS FOR WALLS	T
BRICK MASONRY	8 (200)
CAST-IN-PLACE CONCRETE	6 (150)
CONCRETE MASONRY UNIT	5 (125)
PRECAST REINFORCED CONCRETE SECTION	3 (75)



ALTERNATE METHODS

GENERAL NOTES

Bottom slabs shall be reinforced with a minimum of 0.24 sq. in./ft. (510 sq. mm/m) in both directions with a maximum spacing of 10 (250).

Bottom slabs may be connected to the riser as determined by the fabricator; however, only a single row of reinforcement around the perimeter may be utilized.

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

MINOOKA STANDARD

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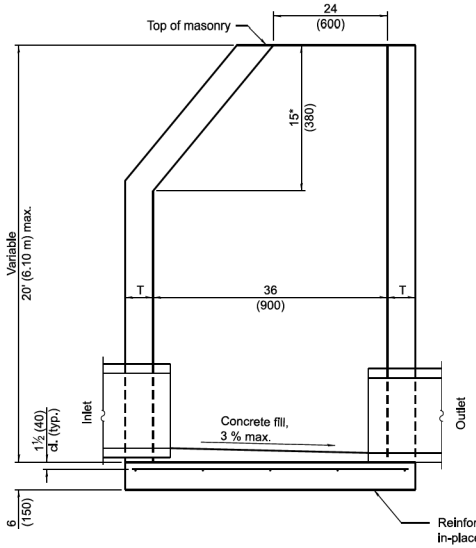
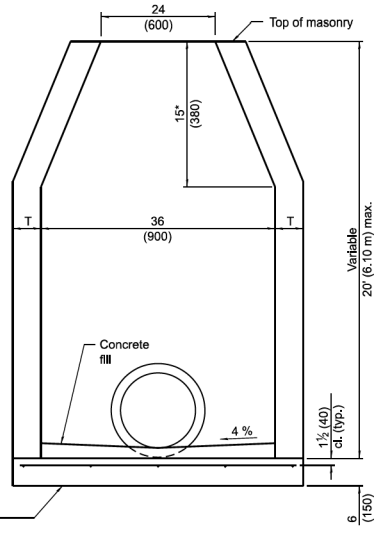
INLET – TYPE B

IDOT STANDARD 602306

* For precast reinforced concrete sections, this dimension may vary from the dimension given to plus 6 (150).

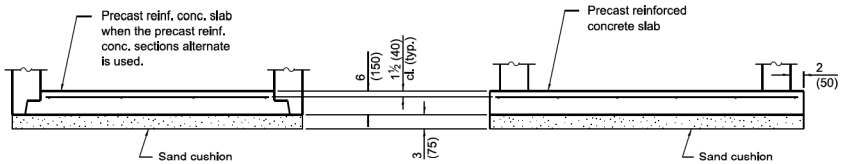


ELEVATION - ECCENTRIC



ELEVATION - CONCENTRIC

ALTERNATE MATERIALS FOR WALLS	T (min.)
Concrete Masonry Unit	5 (125)
Brick Masonry	8 (200)
Precast Reinforced Concrete Section	3 (75)
Cast-in-Place Concrete	6 (150)



ALTERNATE BOTTOM SLAB

GENERAL NOTES

Bottom slabs shall be reinforced with a minimum of 0.20 sq. in./ft. (420 sq. mm/m) in both directions with a maximum spacing of 12 (300).

Bottom slabs may be connected to the riser as determined by the fabricator; however, only a single row of reinforcement around the perimeter may be utilized.

See Standard 602601 for optional Precast Reinforced Concrete Flat Slab Top.

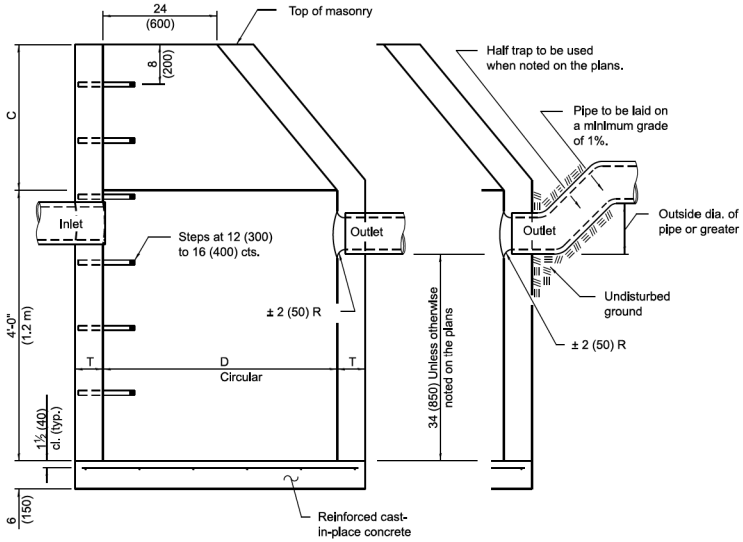
All dimensions are in inches (millimeters) unless otherwise shown.

MINOOKA STANDARD

REV. NOV 2025

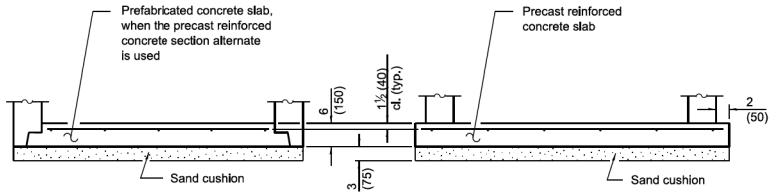
CATCH BASIN – TYPE A

IDOT STANDARD 602001



ELEVATION
(Standard Outlet)

ELEVATION
(Half Trap)



ALTERNATE BOTTOM SLAB

ALTERNATE MATERIALS FOR WALLS	D	C*	T (min.)
Concrete Masonry Unit	4'-0" (1.2 m) 5'-0" (1.5 m)	30 (750) 3'-9" (1.15 m)	5 (125) 5 (125)
Brick Masonry	4'-0" (1.2 m) 5'-0" (1.5 m)	30 (750) 3'-9" (1.15 m)	8 (200) 8 (200)
Precast Reinforced Concrete Section	4'-0" (1.2 m) 5'-0" (1.5 m)	30 (750) 3'-9" (1.15 m)	4 (100) 5 (125)
Cast-in-place Concrete	4'-0" (1.2 m) 5'-0" (1.5 m)	30 (750) 3'-9" (1.15 m)	6 (150) 6 (150)

* For precast reinforced concrete sections, dimension "C" may vary from the dimension given to plus 6 (150).

GENERAL NOTES

Bottom slabs shall be reinforced with a minimum of 0.20 sq. in./ft (420 sq. mm/m) in both directions with a maximum spacing of 12 (300).

Bottom slabs may be connected to the riser as determined by the fabricator; however, only a single row of reinforcement around the perimeter may be utilized.

See Standard 602601 for optional precast reinforced concrete flat slab top.

See Standard 602701 for details of steps.

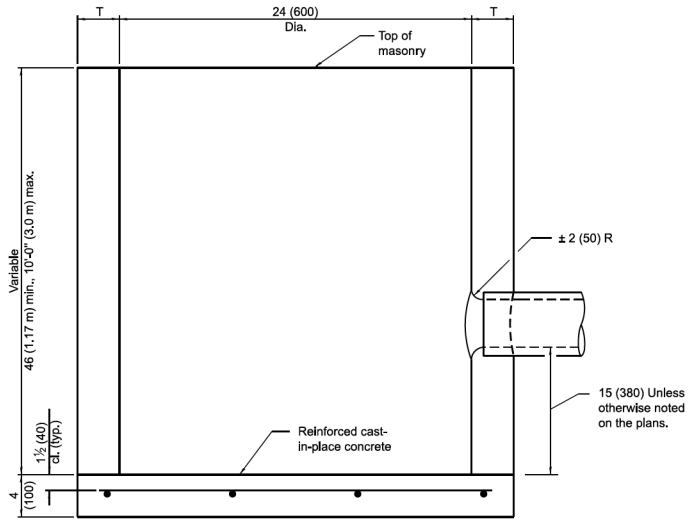
All dimensions are in inches (millimeters) unless otherwise shown.

MINOOKA STANDARD

REV. NOV 2025

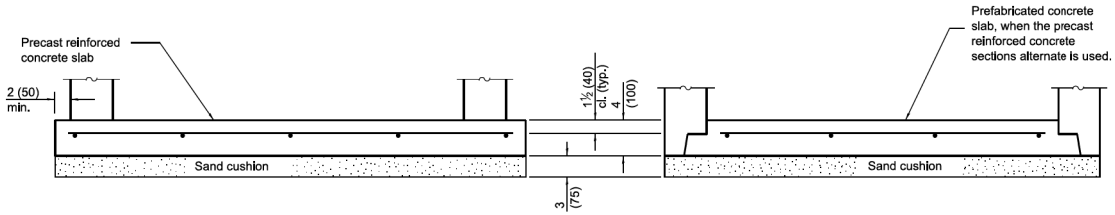
CATCH BASIN – TYPE C

IDOT STANDARD 602011



ELEVATION

ALTERNATE MATERIALS FOR WALLS	T (mln)
Precast Reinforced Concrete Section	3 (75)
Concrete Masonry Unit	5 (125)
Cast-in-Place Concrete	6 (150)
Brick Masonry	8 (200)



ALTERNATE BOTTOM SLAB

GENERAL NOTES

Bottom slabs shall be reinforced with a minimum of 0.27 sq. in./ft. (570 sq. mm/m) in both directions with a maximum spacing of 9 (230).

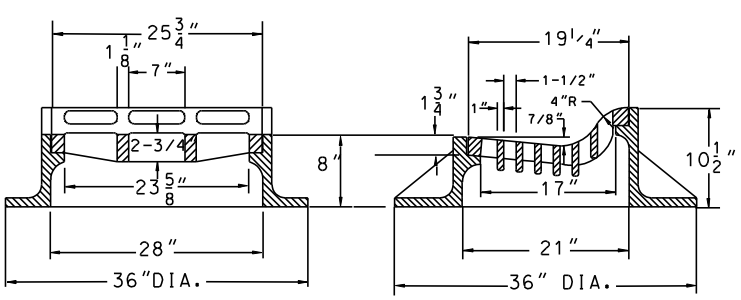
Bottom slabs may be connected to the riser as determined by the fabricator; however, only a single row of reinforcement around the perimeter may be utilized.

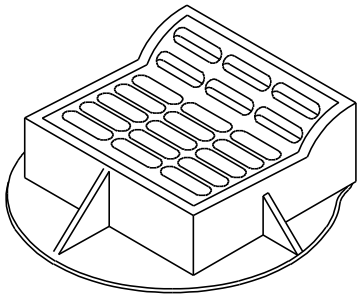
All dimensions are in inches (millimeters) unless otherwise shown.

MINOOKA STANDARD

REV. NOV 2025

MOUNTABLE CURB & GUTTER
FRAME & GRATE





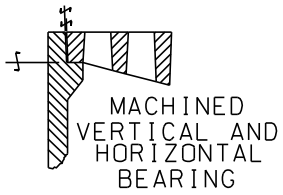
1.) THE FRAME AND GRATE SHALL BE NEENAH R-3501-P OR EJIW 7525 OR APPROVED EQUAL.

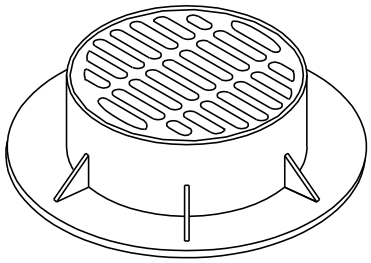
2.) THE FRAME AND GRATE SHALL BE SET ON A MASTIC BED WITH ALL GAPS TUCKPOINTED

MINOOKA STANDARD

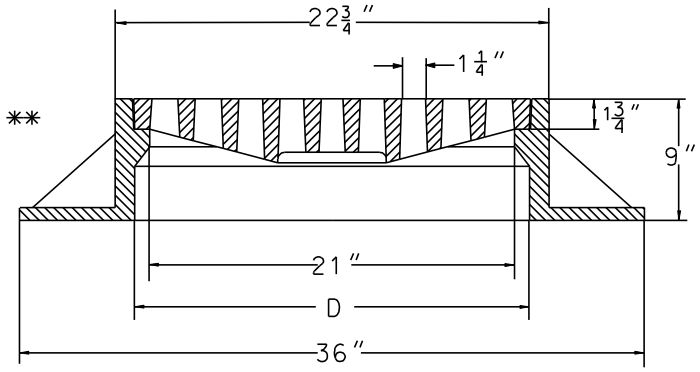
VERSION 1.0

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

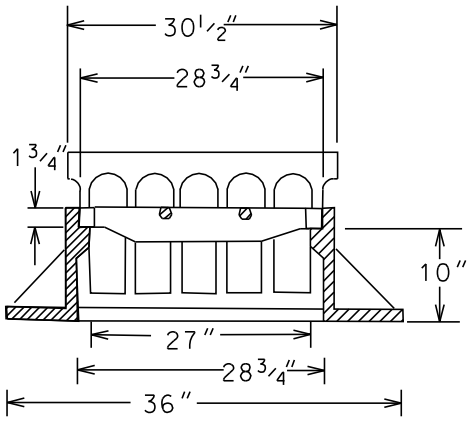
**ALL DIMENSIONS SHOWN ARE FOR THE NEENAH MODELS. EJIW DIMENSIONS MAY VERY.

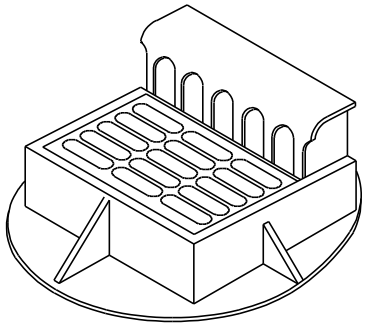
** ALL DIMENSIONS SHOWN ARE FOR THE NEENAH MODELS.
EJIW DIMENSIONS MAY VARY.

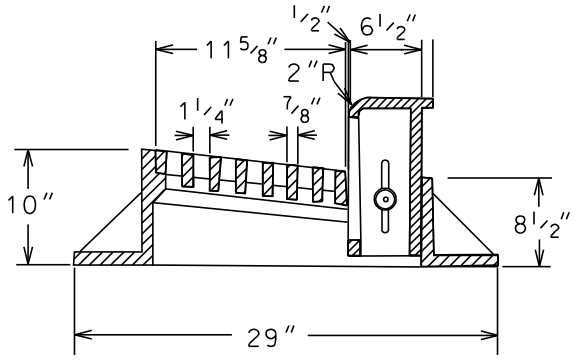
MINOOKA STANDARD

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

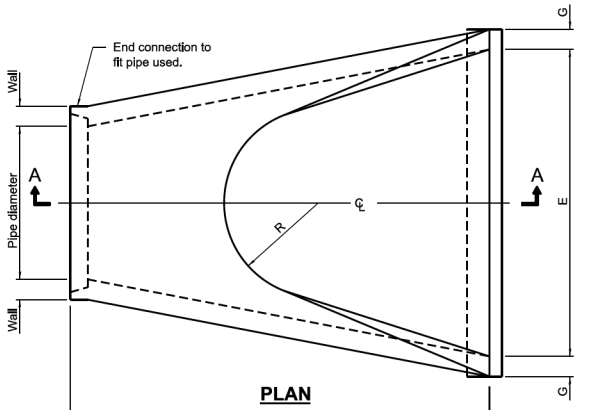
VERSION 1.0

PRECAST REINFORCED CONCRETE FLARED END SECTION

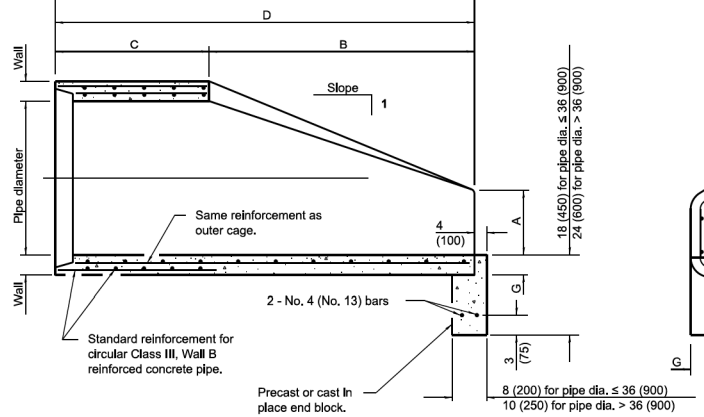
IDOT STANDARD 542301

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

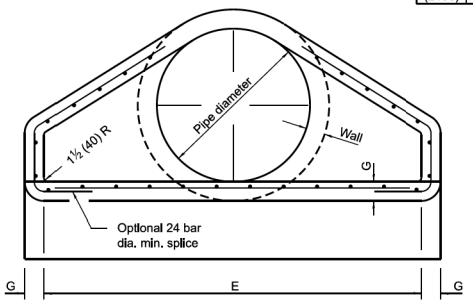
* Radius as furnished by manufacturer



PLAN



SECTION A-A



END VIEW

GENERAL NOTES

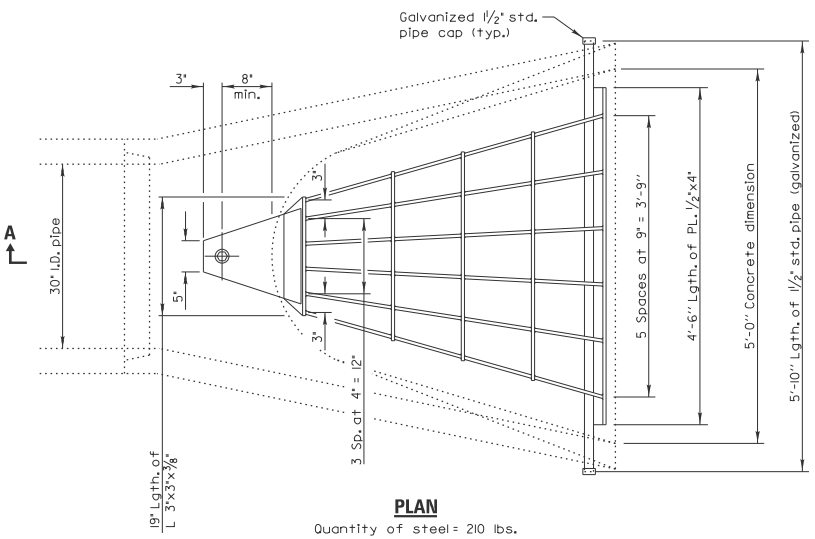
All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V:H).

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

MINOOKA STANDARD

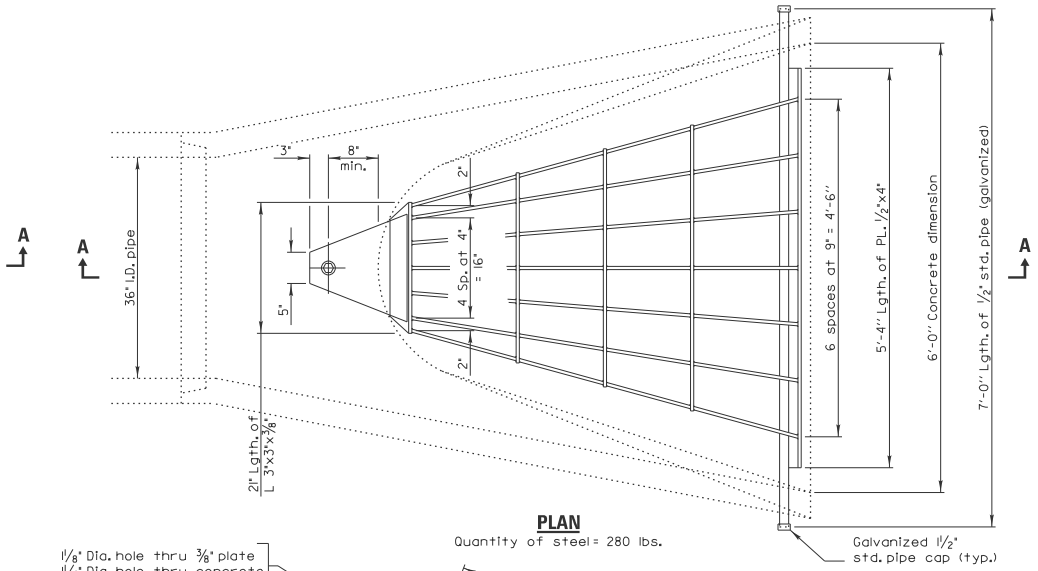
REV. NOV 2025

GRATING FOR CONCRETE FLARED END SECTION



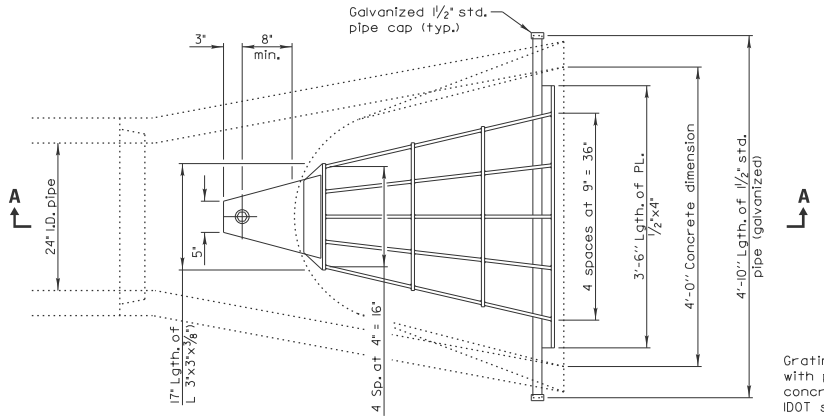
PLAN

Quantity of steel = 210 lbs.



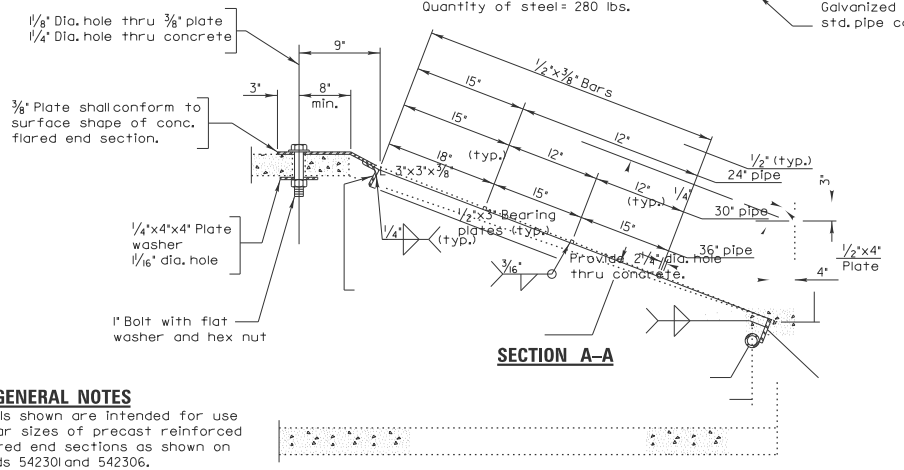
PLAN

Quantity of steel = 280 lbs.



PLAN

Quantity of steel = 150 lbs.



GENERAL NOTES

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

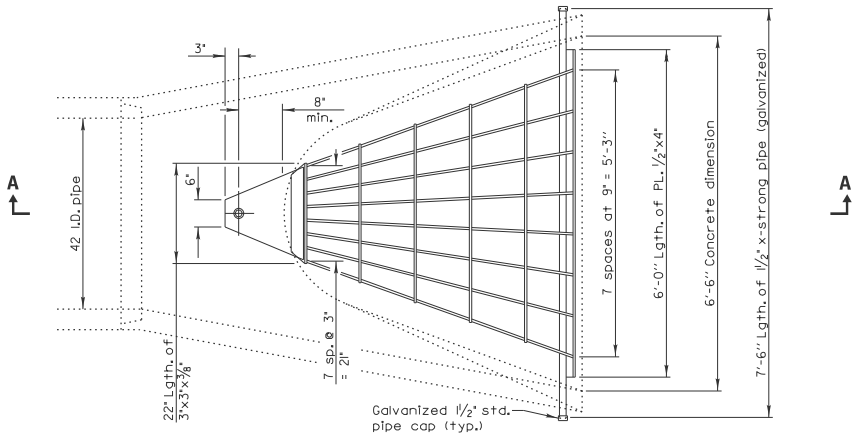
Approximate quantity of steel shown includes total quantity of grating, bolts, nuts, washers and steel pipe.

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

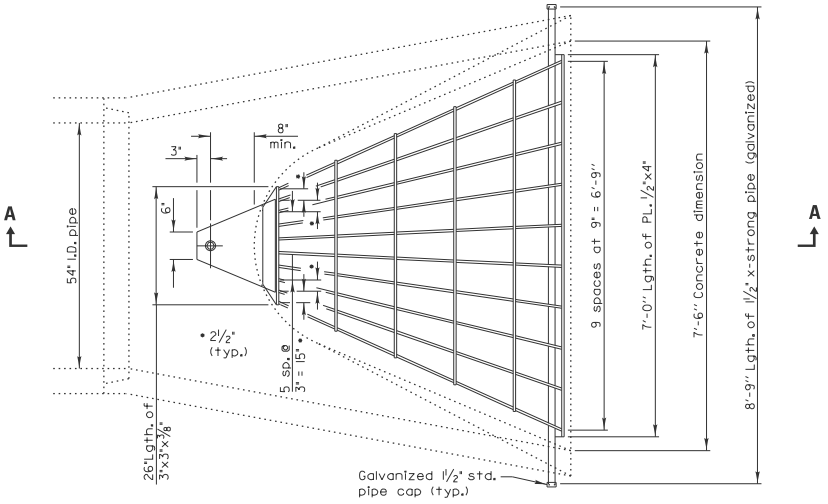
REV. NOV 2025

GRATING FOR CONCRETE FLARED END SECTION



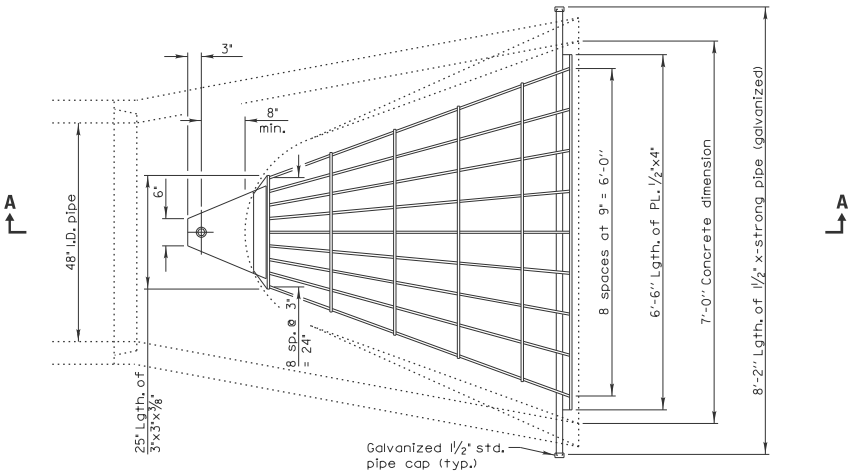
PLAN

Quantity of steel = 320 lbs.



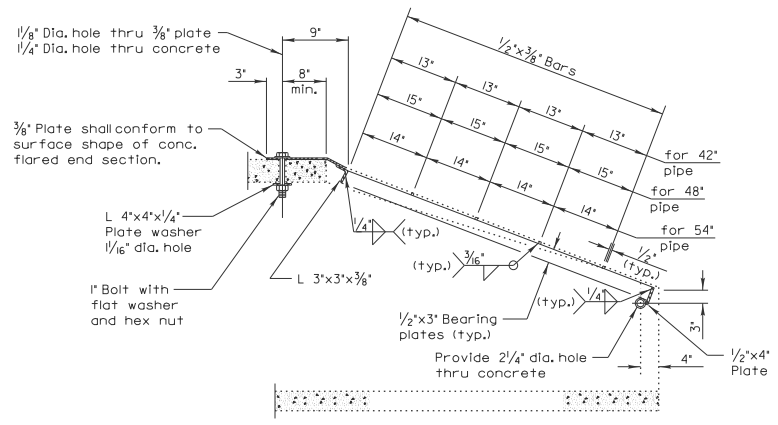
PLAN

Quantity of steel = 425 lbs.



PLAN

Quantity of steel = 400 lbs.

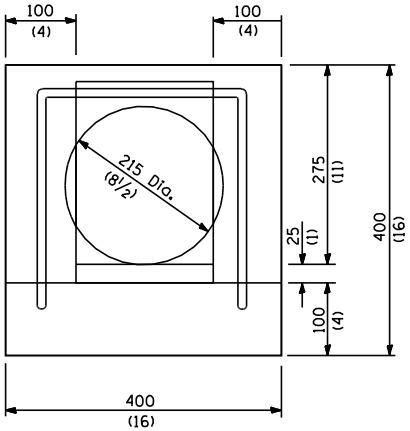


SECTION A–A

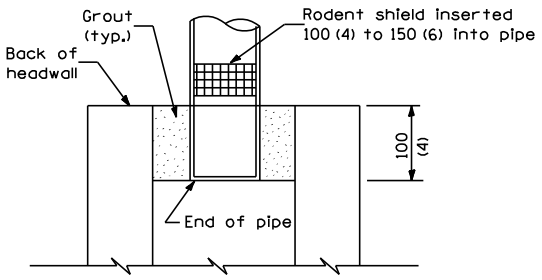
MINOOKA STANDARD

REV. NOV 2025

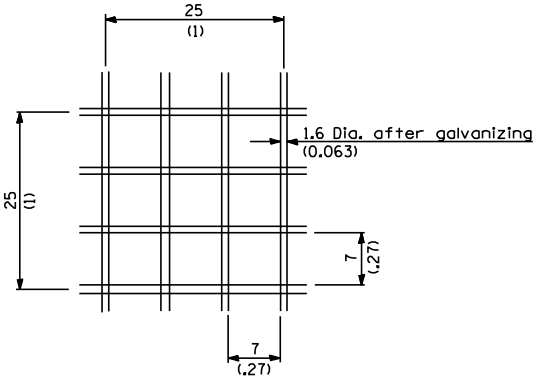
GRATING FOR CONCRETE FLARED END SECTION



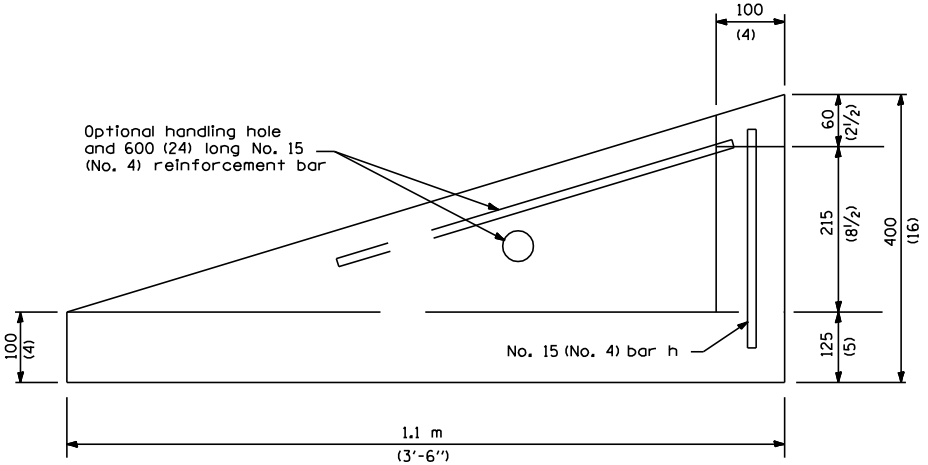
FRONT VIEW



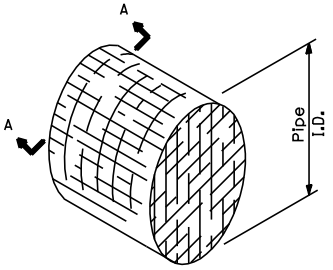
RODENT SHIELD PLACEMENT



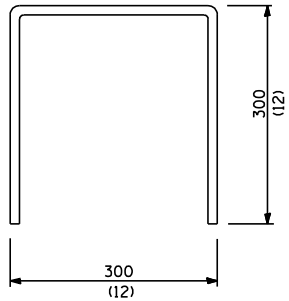
SECTION A-A



SIDE VIEW



DETAIL OF RODENT SHIELD



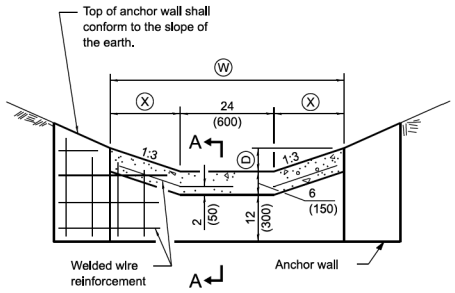
BAR h

MINOOKA STANDARD

VERSION 1.0

LOW FLOW CHANNEL

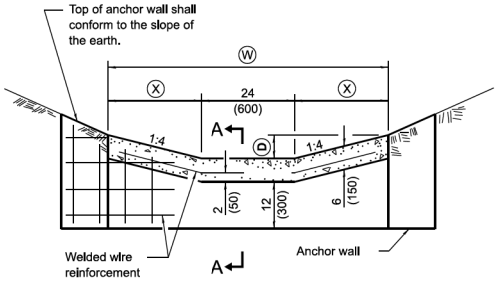
IDOT STANDARD 606401



ELEVATION

TABLE FOR PAVED DITCH TYPE A

TYPE	Ⓓ	Ⓦ	Ⓧ	Flow Area sq. ft. (m²)	Conc. Area sq. yd. (m²)
A-15	6 (150)	5'-0" (1,5 m)	18 (450)	1.75 (0,175)	0.278 (0,225)
A-22	9 (225)	6'-6" (1,95 m)	27 (675)	3.19 (0,287)	0.361 (0,293)
A-30	12 (300)	8'-0" (2,4 m)	36 (900)	5.00 (0,450)	0.444 (0,360)
A-37	15 (375)	9'-6" (2,85 m)	3'-9" (1,12 m)	7.19 (0,645)	0.528 (0,426)
A-45	18 (450)	11'-0" (3,3 m)	4'-6" (1,35 m)	9.75 (0,877)	0.611 (0,495)
A-52	21 (525)	12'-6" (3,75 m)	5'-3" (1,58 m)	12.69 (1,144)	0.694 (0,564)
A-60	24 (600)	14'-0" (4,2 m)	6'-0" (1,8 m)	16.00 (1,440)	0.778 (0,630)

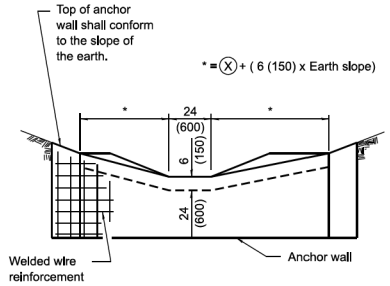


ELEVATION

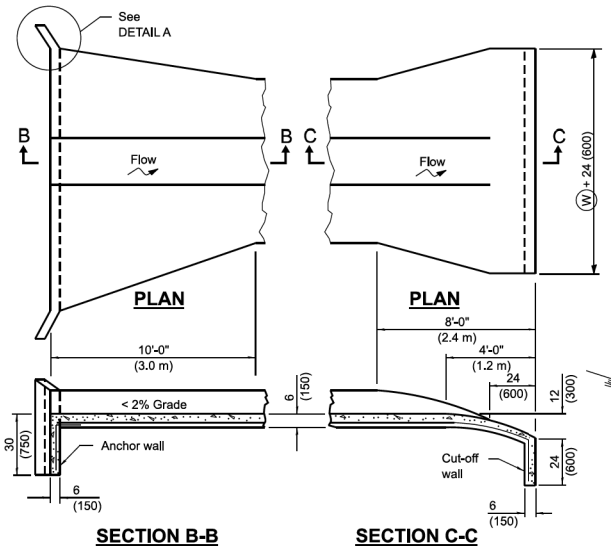
TABLE FOR PAVED DITCH TYPE B

TYPE	Ⓓ	Ⓦ	Ⓧ	Flow Area sq. ft. (m²)	Conc. Area sq. yd. (m²)
B-15	6 (150)	6'-0" (1,8 m)	24 (600)	2.00 (0,180)	0.333 (0,270)
B-22	9 (225)	8'-0" (2,4 m)	36 (900)	3.75 (0,337)	0.444 (0,360)
B-30	12 (300)	10'-0" (3,0 m)	4'-0" (1,2 m)	6.00 (0,540)	0.555 (0,450)
B-37	15 (375)	12'-0" (3,6 m)	5'-0" (1,5 m)	8.75 (0,787)	0.667 (0,540)
B-45	18 (450)	14'-0" (4,2 m)	6'-0" (1,8 m)	12.00 (1,080)	0.778 (0,630)
B-52	21 (525)	16'-0" (4,8 m)	7'-0" (2,1 m)	15.75 (1,417)	0.889 (0,720)
B-60	24 (600)	18'-0" (5,4 m)	8'-0" (2,4 m)	20.00 (1,800)	1.000 (0,810)

PAVED DITCH TYPE A

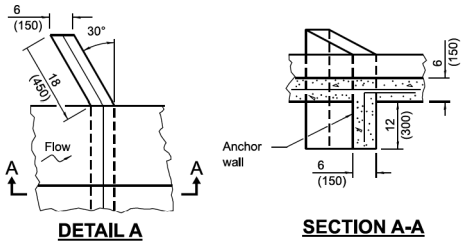


ELEVATION



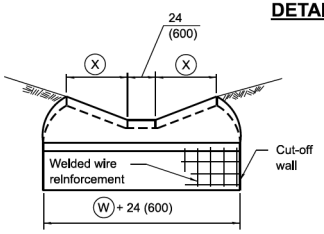
SECTION B-B **SECTION C-C**

PAVED DITCH TYPE B



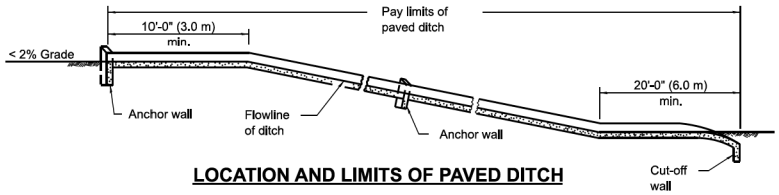
DETAIL A **SECTION A-A**

DETAIL OF ANCHOR WALL



ELEVATION

DETAIL OF UPSTREAM END **DETAIL OF DOWNSTREAM END**



LOCATION AND LIMITS OF PAVED DITCH

GENERAL NOTES

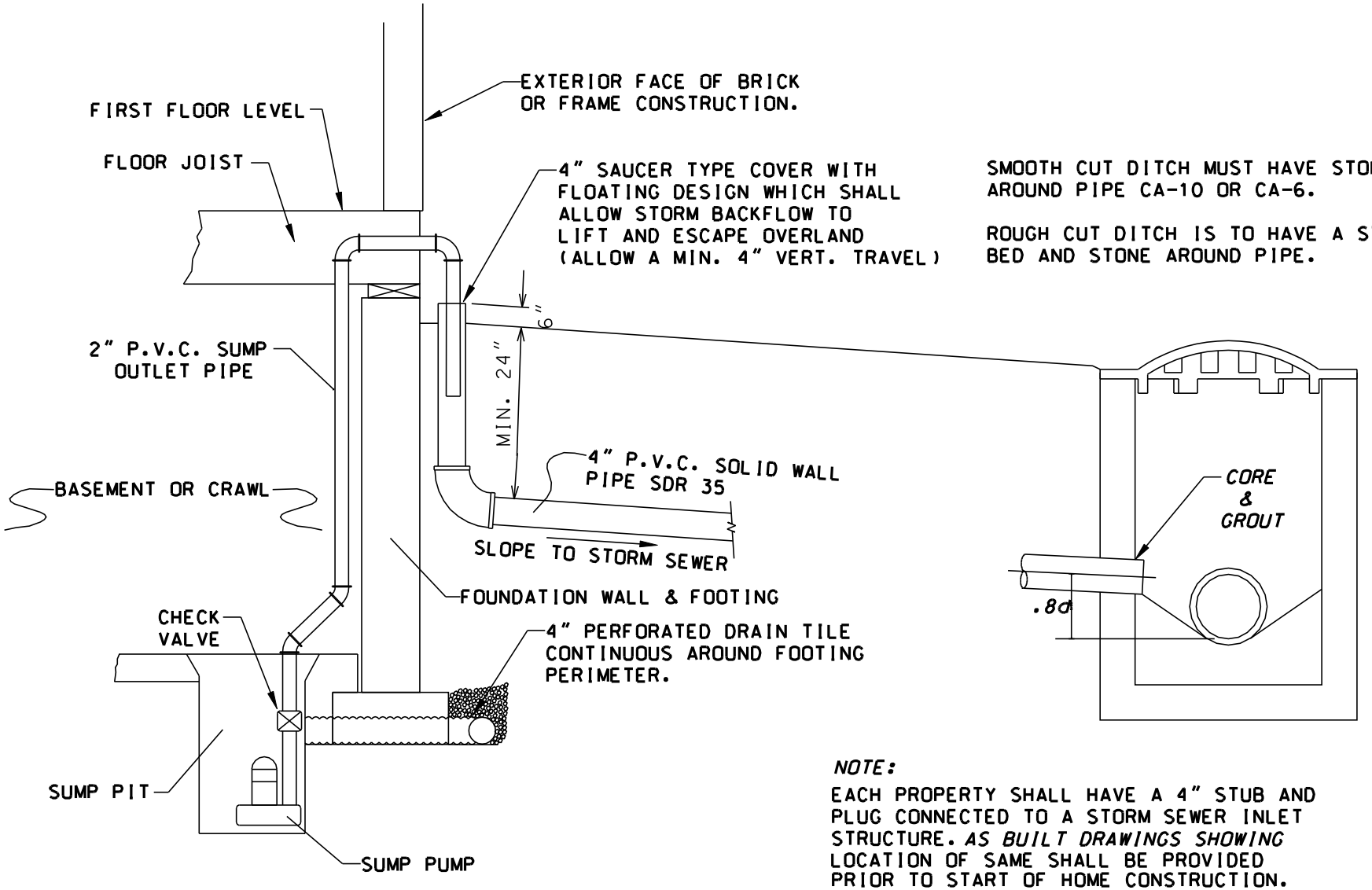
All slopes are expressed as of vertical displacement to units of horizontal displacement (V:H).

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

MINOOKA STANDARD

REV. NOV 2025

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.

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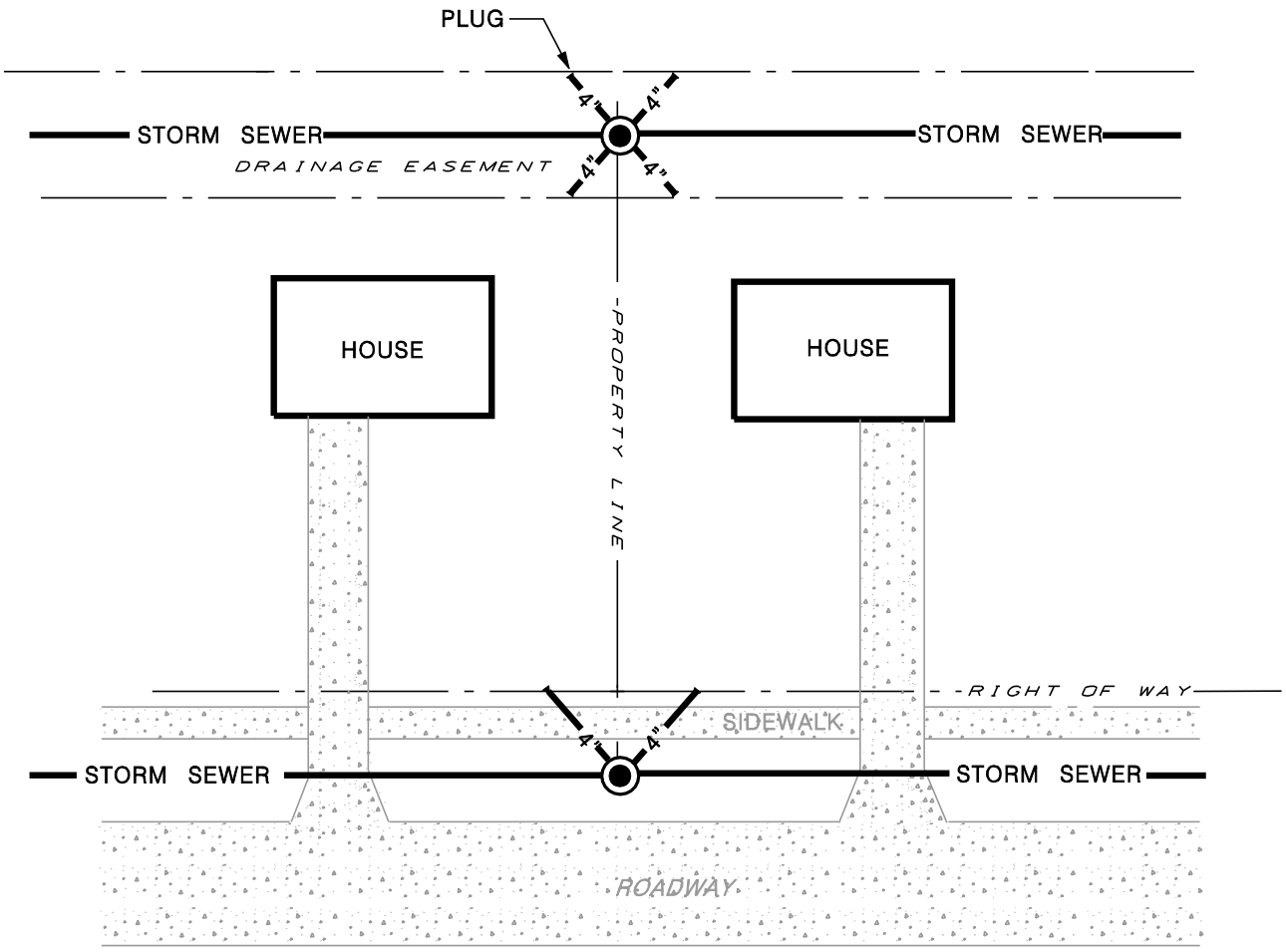
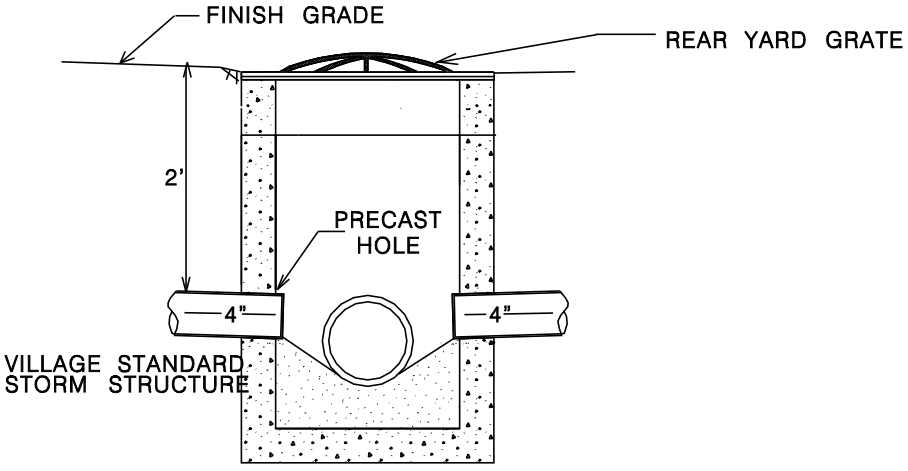
TYPICAL SUMP PUMP CONNECTION TO STORM SEWER





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