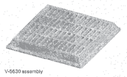
Access Covers, Grates, and Frames — Reversible Frames and Grates

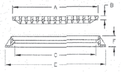
V-5800 REVERSIBLE FRAMES & GRATES

Heavy duty
Reversible unit
Special lettered grates

Options
ADA compliant grates
Extra heavy duty grates
Vane grates



V-5630 assembly



V-5800 Reversible Frame and Grate Options

Frame Series Number	Grate Series Number	Cover Series Number	A Grate Size	B Grate Thickness	C Clear Opening	E Flange Dimension	F Frame Height	Open Area Sq. In.
Square								
V-5613	V-5713	V-6713	13 3/8	1 9/16	11 5/8	19 1/8	4	55
V-5620	V-5720	V-6720	19 3/4	1 1/2	18	25 1/2	4	175
	V-5720-804		19 3/4	1 1/2	18	25 1/2	4	105
	V-5720**		19 3/4	1 1/2	18	25 1/2	4	175
V-5622	V-5622 (D)•	V-6622	23 11/16	1 1/2	22	29 1/4	4	274
	V-5622**		23 11/16	1 1/2	22	29 1/4	4	296
	V-5622-21		23 7/8	1 1/2	22	29 1/4	4	200
	V-5622-808		23 11/16	1 1/2	22	29 1/4	4	168
	V-5622-E		23 3/4	1 1/2	22	29 1/4	4	269
V-5622-1					22	32	5	
V-5624	V-5624	V-6624	25 3/4	1 1/2	24	31 3/8	4	295
	V-5624-804	6208	25 3/4	1 1/2	24	31 3/8	4	194
	V-5624**		25 3/4	1 1/2	24	31 3/8	4	295
V-5626-1	V-5726 (D)•	V-6726	29 3/4	2	24	32	5	318
	V-5726**		29 3/4	2	24	32	5	321
	V-5726-801		25 3/4	2	24	32	5	194
V-5626-2					24	32	6	
V-5630	V-5630	V-6630	31 3/4	1 1/2	30 1/8	37 1/2	4	474
	V-5630**		31 3/4	1 1/2	30 1/8	37 1/2	4	474
	V-5630-801		31 7/8	1 1/2	30 1/8	37 1/2	4	263
V-5630 (D)					30 1/8	37 1/2	4	
V-5632	V-5732 (D)•	V-6732	31 7/8	2	30	38 1/8	5	507
	V-5732**		31 7/8	2	30	38 1/8	5	478
	V-5732-901		31 7/8	2	30	38 1/8	5	283
V-5636	V-5636 (D)•	V-6636	37 1/2	1 1/2	36	43 1/4	4	656
	V-5636**		37 1/2	1 1/2	36	43 1/4	4	651
	V-5636H		37 1/2	1 1/2	36	43 1/4	4	356
V-5636 (D)					36	43 1/4	4	
V-5642 (2P)	V-5742 (2P)	V-6642 (2P)	43 7/8	2	41 3/4	50 1/8	5	868
	V-5742 (2P)**		43 7/8	2	41 3/4	50 1/8	5	868
V-5648 (2P)	V-5648 (2P)	V-6648 (2P)	50 5/8	1 5/8	48 5/8	58 5/8	4 3/8	1300
	V-5648 (2P)**		50 5/8	1 5/8	48 5/8	58 5/8	4 3/8	1400

Note: all dimensions are in inches.
** Ductile Iron Extra Heavy Duty Grate • Vane Grate ♦ ADA Compliant Grate (2P) 2 Piece (2 frames/2 covers/2 grates) (D) Ductile Iron
+ Intermediate grate design. See page 202 for details.

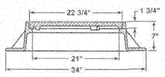
Supplied By: TRENCHDRAIN SUPPLY 877-903-7246 www.trenchdrainsupply.com

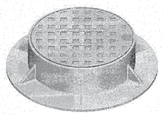
201

R-1772
Manhole Frame, Solid Lid

Heavy Duty

Non-Rocking feature available, see p. 12.





Available Grate: **R-2502**

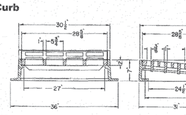
R-4342
Ditch Grate, Stool Type

Light Duty

CATALOG NUMBER	GRATE TYPE	SQ. FT. OPEN	WEIR PERIMETER LINEAL FEET
R-4342	Beehive	3.9	8.0

R-3501-R
Inlet for Roll Type Curb

Heavy Duty



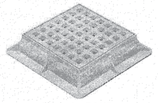
CATALOG NUMBER	GRATE TYPE	SQ. FT. OPEN	WEIR PERIMETER LINEAL FEET
R-3501-R	C	2.8	5.5

Available with 4-flange frame, order **R-3501-RA.**

R-3404 to R-3405 Series
Gutter Inlet Frame, Grate

Heavy Duty

CATALOG NUMBER	GRATE TYPE	SQ. FT. OPEN	WEIR PERIMETER LINEAL FEET
R-3404	H	1.4	7.2
R-3405	H	1.5	7.9
R-3405-A	H	1.3	8.0
R-3405-A	L	1.5	8.0
R-3405-B	H	1.3	8.0
R-3405-B	L	1.5	8.0
R-3405-D3	H	3.5	10
R-3405-D4	H	3.5	10



Illustrating R-3405

Dimensions in inches

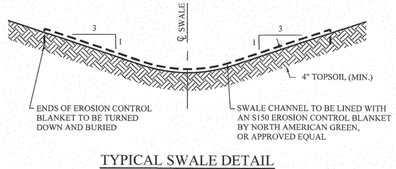
Catalog No.	A	B	C	E	F	G	H
R-3404	21 1/2 x 21 1/2	1 1/2	20 1/8 x 20 1/8	30 5/8 x 30 5/8	5 1/8	2 x 2	15/16
R-3405	23 5/8 x 23 5/8	1 1/2	22 x 22	32 3/4 x 32 3/4	6	2 1/8 x 2 1/8	1
R-3405-A **	23 7/8 x 23 7/8	2	22 x 22	32 1/8 x 32 1/8	6 1/8	2 1/4 x 2 1/4	1 7/16
R-3405-B * **	23 7/8 x 23 7/8	2	22 x 22	32 1/8 x 29	6 1/8	2 1/4 x 2 1/4	1 7/16
R-3405-D3 +	29 3/4 x 29 3/4	1 7/16	28 1/2 x 28 1/2	34 3/4 x 38	6	3 3/4 x 3 3/4	1 1/16
R-3405-D4	29 3/4 x 29 3/4	1 7/16	28 1/2 x 28 1/2	38 x 38	6	3 3/4 x 3 3/4	1 1/16

* Same as R-3405-A except base flange on 3 sides only.
** Also available grate Type L.
+ Same as R-3405-D4 except base flange on 3 sides only.

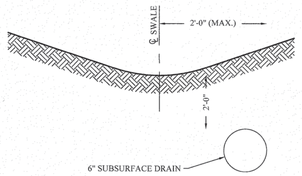
Type L

NOTE

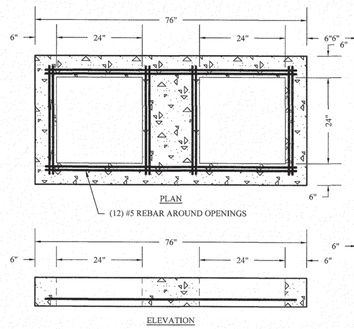
ALL STORM INLET CASTINGS NEED TO BE STAMPED OR EMBOSSED WITH "NO DUMPING/FLOWS TO STREAM"



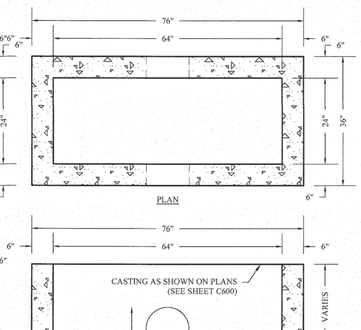
TYPICAL SWALE DETAIL
NOT-TO-SCALE



SUBSURFACE DRAIN SWALE DETAIL
NOT-TO-SCALE



PLAN

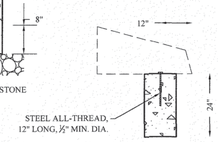


PLAN

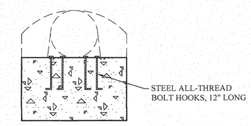
ELEVATION

NOTE:
CONTRACTOR TO INSTALL WITH R-3501-TR & TL CASTINGS ONLY

24" x 64" DOUBLE CURB INLET (TOP) DETAIL
NOT-TO-SCALE



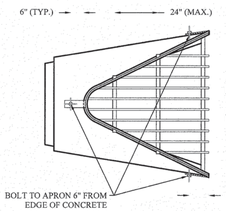
PROFILE VIEW



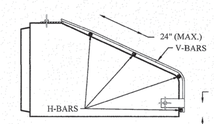
SECTION VIEW

NOTES:
ALL-THREAD SPACING TO BE TWO PER FOOT
EX.: 12" END SECTION = 2 ALL-THREAD
24" END SECTION = 4 ALL-THREAD

ANCHOR FOR CONCRETE END SECTIONS
NOT-TO-SCALE



PLAN VIEW



PROFILE VIEW

TRASH GUARD FOR CONCRETE APRONS
NOT-TO-SCALE

APRON SIZE (INCHES)	V-BAR SIZE (INCHES)	No. OF BARS REQ'D	H-BAR SIZE (INCHES)	BOLT DIA. (INCHES)	"A" DIM. (INCHES)
ARCH PIPE APRONS					
18	1/2	3	5/8	1/2	5
24	5/8	4	3/4	1/2	7
30	5/8	4	3/4	1/2	7 1/2
36	3/4	4	1	1/2	10 1/2
42	3/4	4	1	3/4	11
48	3/4	4	1 1/2 PIPE	3/4	12
54	3/4	4	1 1/2 PIPE	3/4	12
60	3/4	5	1 1/2 PIPE	3/4	14
72	3/4	5	1 1/2 PIPE	3/4	14
84	3/4	6	1 1/2 PIPE	3/4	15
ROUND PIPE APRONS					
12	1/2	3	5/8	1/2	4
15	1/2	3	5/8	1/2	4 1/2
18	1/2	4	5/8	1/2	4 1/2
21	1/2	4	5/8	1/2	5
24	5/8	4	3/4	1/2	5
27	5/8	4	3/4	1/2	5 1/2
30	5/8	4	3/4	1/2	5 1/2
36	3/4	4	1	3/4	8
42	3/4	4	1	3/4	8
48	3/4	5	1	3/4	8
54	3/4	5	1 1/2 PIPE	3/4	8
60	3/4	5	1 1/2 PIPE	3/4	8
66	3/4	6	1 1/2 PIPE	3/4	8
72	3/4	6	1 1/2 PIPE	3/4	9
84	3/4	7	1 1/2 PIPE	3/4	10
90	3/4	7	1 1/2 PIPE	3/4	14

NOTES:
1. BARS AND PLATES ARE HOT-ROLLED STEEL.
2. BARS, PLATES, AND PIPE ARE FINISHED WITH 2 COATS OF ALUMINUM PAINT.
3. BOLTS ARE GALVANIZED.
4. SEE STANDARD PLATES A-10 AND A-11 FOR APRON DIMENSIONS.
5. TRASH GUARDS WITH DIFFERENT DIAMETER BARS ARE AVAILABLE, SPECIAL ORDER.

D2 Land & Water Resource, Inc.

ROLLMAX™ SOIL EROSION CONTROL

Specification Sheet – Vmax® SC250® Turf Reinforcement Mat

DESCRIPTION

The composite turf reinforcement mat (TRM) shall be a non-woven protected core of 70% straw and 30% coconut fiber matrix (mesocut) plus permanent three-dimensional turf reinforcement matrix (TDM) with 100% coverage of machine direction (MD) metal staples at the meeting yard which bonds between a top-side (TS) stabilized netting (with 0.5(L)×0.5(W) inch (0.01×0.01 m) openings), and a bottom-side (BS) stabilized netting (with 0.5(L)×0.5(W) inch (0.01×0.01 m) openings) interbonded with TS and BS nettings. The TDM shall be a 0.5 inch (0.01 m) thick, 3-dimensional, UV stabilized, chemically complexed (thermoset) polyethylene bonded to nettings (L) x (W) x (H) 21 (5.1) x 21 (5.1) x 0.5 (0.01) inch (m) with 100% coverage. The TRM shall be anchored (up to 3) through (P) of 12" (300 mm) staples. The staples consist of a netting shall have prominent (double) crescent ridges across the entire width of the mat. The three netting's shall be protected (reinforced) by 110 (4.0) (P) thermoplastic with UV stabilized (black) polypropylene (PP) netting (with 0.5(L)×0.5(W) inch (0.01×0.01 m) openings) (mesh) (mesh). All parts shall be injection molded with a crescent like wave ridges (both sides) angled as per a saw-tooth pattern (alternate rows).

The SC250® shall meet Type 5A, 5B, and 5C, and the application requirements specified by the Erosion Control Technology Council (ECTC) and North Carolina Department of Transportation (NCDOT) for Turf Reinforcement Mats (TRMs). RF-05 Section 1016.18.

Material Content	
Matrix	70% Straw Fiber 30% Coconut Fiber
Netting	Top and Bottom, UV Stabilized Polypropylene Middle, Stabilized UV Stabilized Polypropylene
Thread	Polypropylene – UV Stable

Production Specifications	
Width	1.5 ft (0.5 m)
Length	20 ft (6.10 m)
Weight (-10%)	28 lb (12.70 kg)
Area	40 sq yd (33.4 m2)

Tensile Properties	Test Method	Field Values
Machinery	ASTM D5035	55 lb/ft (0.8 kN/m)
Weaving	ASTM D1777	55 (%)
Density	ASTM D792	0.9 g/cm³
Mass/Unit Area	ASTM D6566	10 oz/yd² (340 g/m²)
UV Stability	ASTM D4355/ D6159-98	80%
Permeability	ECTC Guidelines	100%
Stiffness	ASTM D6574	140,000 mg-cm
Light Penetration	ASTM D6567	4.0%
Tensile Strength – MD	ASTM D5035	175 lb/ft (2.6 kN/m)
Elongation – MD	ASTM D5035	20.0%
Tensile Strength – TD	ASTM D5035	125 lb/ft (1.8 kN/m)
Elongation – TD	ASTM D5035	15.0%
Biomass Supplemented	ASTM D7322	>300%

Design Permissible Shear Stress		
	Short Duration	Long Duration
Phase 1: Unvegetated	2.0 psf (100 Pa)	2.0 psf (100 Pa)
Phase 2: Partially Veg.	8.0 psf (381 Pa)	5.5 psf (263 Pa)
Phase 3: Full Veg.	9.0 psf (431 Pa)	6.0 psf (287 Pa)
Unvegetated Manning	0.033 (0.033 - 0.036)	
Vegetated Manning	0.036 (0.036 - 0.039)	

ERODION CONTROL – GEOSYNTHETICS – POROUS PAVEMENT
SEDIMENT CONTROL – STORM WATER MANAGEMENT

800 597-2180 fax 317 917-2181 www.D2LWR.com info@D2LWR.com

D2 Land & Water Resource, Inc.

Slope Section Factor (LS) Factors

Slope Length (ft)	0-5	5-15	15-50
≤ 20 (6.0)	0.2(0)	0.3(0)	0.5(0)
30 (9.0)	0.8(0)	0.9(0)	0.9(0)
≥ 40 (12.2 m)	0.9(0)	0.9(0)	1.0(0)

Design Cover/Crop Factors (Ratio)

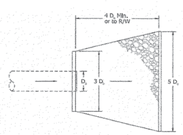
Pre-Dev.	Post-Dev.
1.0 (0.0 lb/1,000 ft²)	0.0(0)
0.7(1 ± 0.3)	0.1(0.1 ± 0.1)
1.0 (0.0 lb/1,000 ft²)	0.1(0)

ERODION CONTROL – GEOSYNTHETICS – POROUS PAVEMENT
SEDIMENT CONTROL – STORM WATER MANAGEMENT

800 597-2180 fax 317 917-2181 www.D2LWR.com info@D2LWR.com

Bakers Pointe
Job #105263DRH

RipRap Apron Calcs



D_o = Outside Diameter of structure

Stream Velocity for Erosion Protection INDOT Figure 203-2D

Erosion-Protection Method	Velocity, v (ft/s)
Revetment Riprap	≤ 6.5
Class 1 Riprap	6.5 < v ≤ 10
Class 2 Riprap	10 ≤ v ≤ 13
Energy Dissipator	> 13

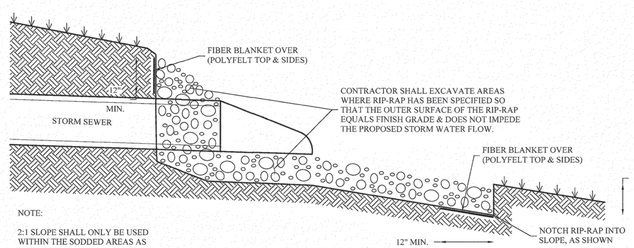
$$L = 1.8D\left(\frac{Q}{D^{2.5}}\right) + 7D$$

L=Apron Length (ft)
Q= Flow (cfs)
v=Velocity (ft/s)
D=Diameter (ft)
Tw=Tailwater (ft)

Section 1
Section 2
Section 3

INDOT Figure 203-2J - Minimum Riprap Apron Size

				RipRap Apron			
Str #	Outlet Flow, Q (cfs)	Outlet Velocity, v (ft/s)	Outlet Diameter (ft)	Start Width (ft)	End Width (ft)	Tw < 0.5D Length (ft)	Erosion-Protection Method
400	6.91	4.03	2.50	7.5	12.5	20.8	Revetment Riprap
402	6.09	3.43	2.00	6	10	17.9	Revetment Riprap
408	10.30	3.23	2.50	7.5	12.5	22.2	Revetment Riprap
419	69.65	5.47	4.50	13.5	22.5	44.6	Revetment Riprap
451	0.63	1.45	1.00	3	5	8.1	Revetment Riprap
452	0.50	1.29	1.00	3	5	7.9	Revetment Riprap
458	1.54	1.71	1.00	3	5	9.8	Revetment Riprap
483	45.23	4.02	3.00	9	15	36.7	Revetment Riprap
489	6.56	6.46	1.50	4.5	7.5	16.9	Revetment Riprap
496	16.50	4.50	2.50	7.5	12.5	25.0	Revetment Riprap
519	1.57	6.48	1.00	3	5	9.8	Revetment Riprap
521	13.07	6.37	1.75	5.25	8.75	22.4	Revetment Riprap
531	0.64	2.12	1.00	3	5	8.2	Revetment Riprap



NOTE:
2:1 SLOPE SHALL ONLY BE USED WITHIN THE SODDED AREAS AS SHOWN. TRANSITION TO TYPICAL 5:1 SLOPE WITHIN NEXT FIVE (5) FEET.

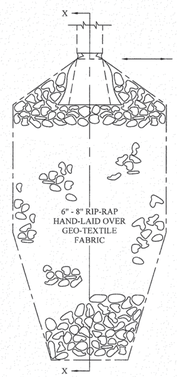
END SECTION OUTFALL DETAIL
(SECTION 'X-X')
NOT-TO-SCALE

RECORD DRAWING

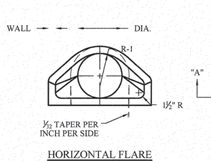
Dennis D. Olmstead
Professional Land Surveyor
No. 900012

9/10/2025

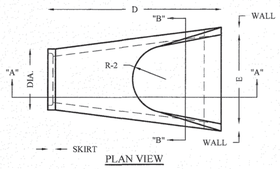
DENNIS D. OLMSTEAD REGISTERED No. 900012 STATE OF INDIANA LAND SURVEYOR



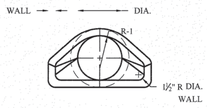
RIP-RAP DETAIL
NOT-TO-SCALE



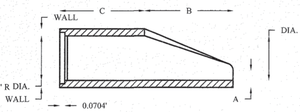
HORIZONTAL FLARE
SECTION "B-B"



PLAN VIEW



VERTICAL FLARE
SECTION "B-B"



(GROOVE-OUTLET END)
(TONGUE-INLET END)
SECTION VIEW
SECTION "A-A"

DIA.	WALL	G / T	WT. SEC.	A	B	C	D	E	DIA.+1"	R-1	R-2	SKIRT
12"	2"	1½"	530#	4"	24"	48⅛"	72⅞"	24"	13"	10 1/16"	9"	3½"
15"	2¼"	2"	740#	6"	27"	46"	73"	30"	16"	12½"	11"	3½"
18"	2½"	2½"	990#	9"	27"	46"	73"	36"	19"	15½"	12"	4"
21"	2¾"	2½"	1,280#	9"	35"	38"	73"	42"	22"	16⅞"	13"	4"
24"	3"	2½"	1,520#	9½"	43½"	30"	73½"	48"	25"	16 1/16"	14"	4½"
27"	3¼"	2½"	1,930#	10½"	48"	25½"	73½"	54"	28"	17½"	14½"	4½"
30"	3½"	3"	2,190#	12"	54"	19½"	73½"	60"	31"	18⅜"	15"	5"
36"	4"	3½"	4,100#	15"	63"	34½"	97½"	72"	37"	24 1/16"	20"	5½"
42"	4½"	3½"	5,380#	21"	63"	35"	98"	78"	43"	27½"	22"	5½"
48"	5"	4½"	6,550#	24"	72"	26"	98"	84"	49"	28½"	22"	5½"
54"	5½"	4½"	8,040#	27"	65"	35"	100"	90"	55"	32½"	24"	6½"
60"	6"	5"	8,750#	30"	60"	39"	99"	96"	61"	36½"	24"	6½"
66"	6½"	5½"	10,630	24"	78"	21"	99"	102"	67"	35 1/16"	24"	7½"
72"	7"	6"	12,520#	34"	78"	21"	99"	108"	73"	38½"	24"	7½"
78"	7½"	6½"	14,430#	24"	78"	21"	99"	114"	79"	41 7/16"	24"	8½"
84"	8"	7"	16,350#	24"	78"	21"	99"	120"	85"	44 1/16"	24"	9"

NOTES:
MANUFACTURE OF END SECTION IS IN ACCORDANCE WITH APPLICABLE PORTIONS OF A.S.T.M. SPECIFICATION C76.

PRE-CAST CONCRETE END SECTION DETAIL
NOT-TO-SCALE

DATE	MARK	REVISIONS	BY
09/09/25	AS BUILTS	M/E	
02/26/25	REVISED PER FUTURE C.R. W. 600 S. IMPROVEMENTS	GEM	
09/25/24	REVISED HANDICAP RAMPS AT ENTRANCE TO S.R. 30 ADDED FH.	GEM	
08/27/24	REVISED PER REVIEW COMMENTS	GEM	
07/09/24	REVISED PER REVIEW COMMENTS	GEM	
06/06/24	UPDATED TO NEW DRAINAGE ORDINANCE	KKG/GEM	

BRIAN MILLER BROWN REGISTERED No. PE11200386 STATE OF INDIANA PROFESSIONAL ENGINEER

THIS DRAWING IS NOT INTENDED TO BE REPRESENTED AS A RETRACEMENT OR ORIGINAL BOUNDARY SURVEY, A ROUTE SURVEY, OR A SURVEYOR LOCATION REPORT.

CERTIFIED: 05/06/24

STOEPPELWERTH & DAYSON
ALWAYS ON
7965 East 106th Street, Fishers, IN 46038-2505
phone: 317.849.5935 fax: 317.849.5942

CONTRUCTION DETAILS

BAKER'S POINTE
SECTIONS 1A & AB

MADISON COUNTY, INDIANA
PENDLETON, FALL CREEK TOWNSHIP

DRAWN BY: KJJM/GEM
CHECKED BY: KRG
SHEET NO. C803
S & A JOB NO. 105263DRH-S1

File Name: S:\105263DRH-S1\DWG\C800 - Construction Details.dwg - C803
Modified By: September 9, 2025 2:04:39 PM / mevans
Plotted By: September 9, 2025 2:05:28 PM / Michael Evans