

**General Notes**

- Contractor shall comply with all local, state and federal codes, ordinances, rules, regulations, orders and other legal requirements of municipal authorities which bear on the performance of the work.
- The contractor is cautioned that the location and/or elevation of existing utilities as shown on these plans is based on records of various utility companies, and where possible measurements taken in the field. The information is not to be relied on as being exact or complete. The contractor must contact the appropriate utility company at least 48 hours before any excavation to request exact field location of utilities.  
Indiana Underground Utility Locate Service  
Phone: 811
- Material specifications shall be in conformance with applicable portions of the INDOT standard specifications, (latest edition) unless specifically stated otherwise on these plans, contract documents or local code.
- All sewer lateral and utility street crossings required full aggregate backfill.

**Existing Legend**

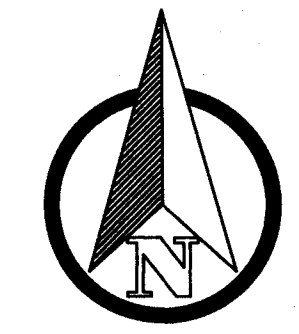
- Cleanout
- Communication Junction Box
- Electric Transformer
- Fire Hydrant
- Sanitary Sewer Manhole
- Sanitary Sewer Main
- Storm Sewer Manhole
- Water Meter
- Water Valve
- Center Line
- Easement Line
- Fence Line
- Property Boundary Line
- Right-of-way Line
- 
- Zoning
- Calculated Dimension
- Measured Dimension
- Plat Dimension per Green River Meadows Section 1
- Record Dimension
- Point Of Beginning
- Point Of Commencement

**Proposed Legend**

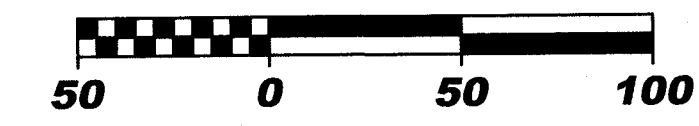
- Rolled Curb and Gutter
- Bituminous Pavement
- Curb Inlet, CI
- Area Drain, AD
- Storm Manhole, MH
- Flared End Section, FES
- Storm Pipe, P
- Swale and Direction of Flow
- Proposed Easement Line
- Sanitary Sewer Manhole, SSMH
- Sanitary Sewer Pipe
- Potable Water Main

**Note:**

Banks of Proposed Detention Basin are to be planted with native grasses and wildflowers (e.g. Milkweed).



SCALE 1" = 50'

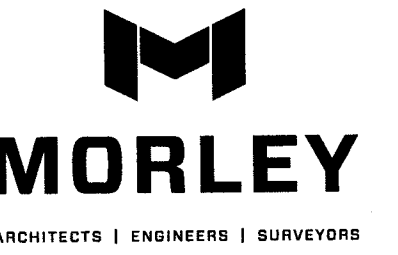
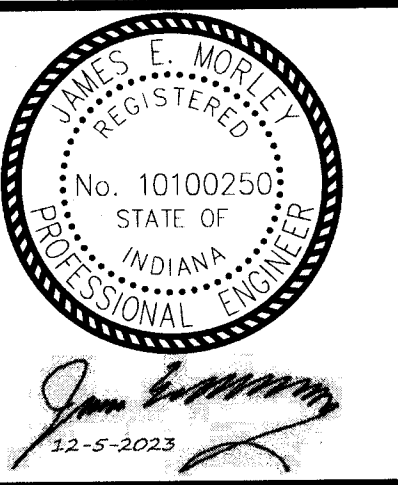


**Benchmark Data**

Elevations are based on NAVD88 derived from on-site RTK GPS observations utilizing the INDOT inCORS network.

**TBM #1 = 401.89** - Chiseled "X" on Northeast bolt on fire hydrant near East end of Surveyed Property

**TBM #2 = 394.24** - Chiseled "X" on North side of sanitary sewer manhole rim near West end of Surveyed Property.

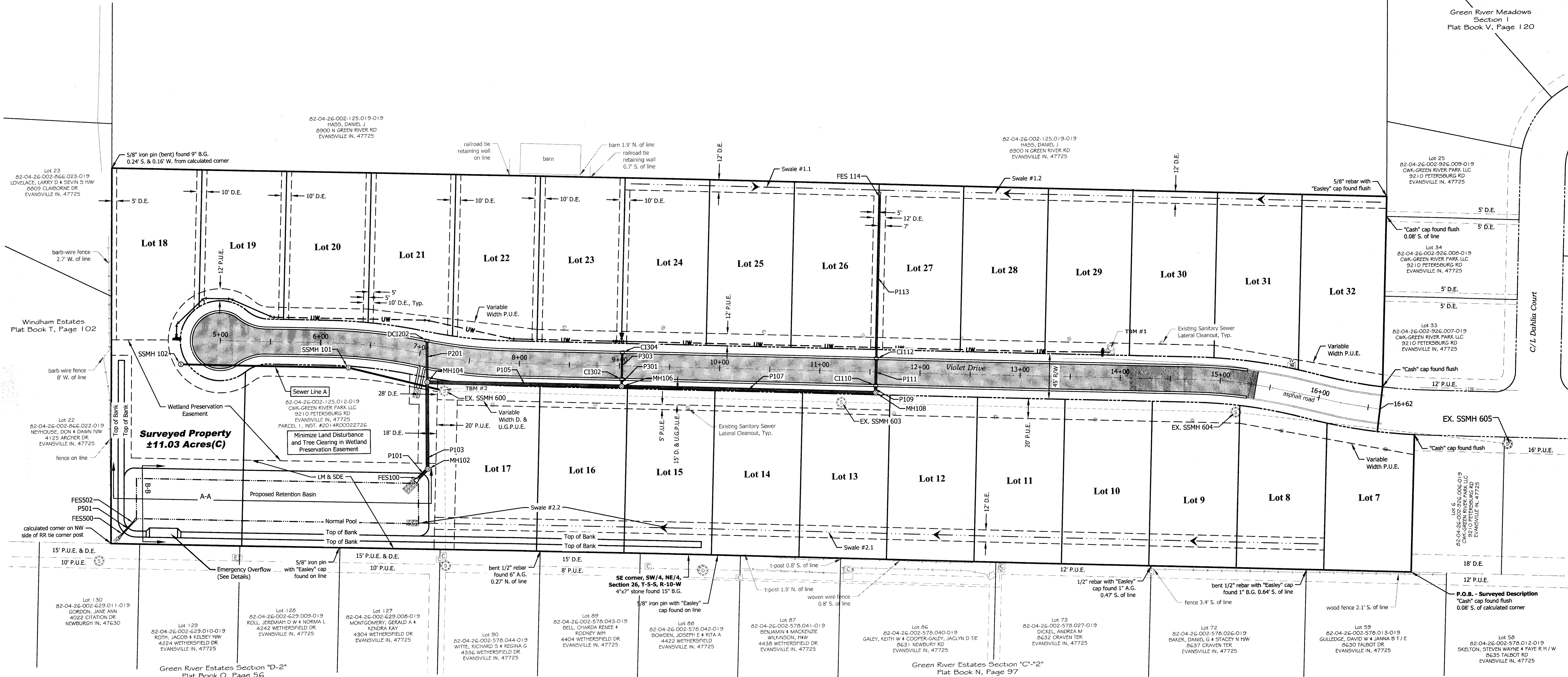


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Green River Meadows Section 2  
8800 N. Green River Road  
Evansville, IN 47725

**APPROVED**  
DEC 05 2023  
VANDERBURGH COUNTY  
DRAINAGE BOARD  
**Infrastructure Plan**  
Vanderburgh County, IN



No.	By	Date
<b>Revisions</b>		
Scale: 1" = 50'		
Designed By:	JEM	Job Number: 12103.4.001-B
Drawn By:	KJL	Date: 12-5-2023
Filename:	12103 Civil Base	
Sheet Number:	<b>C101</b>	



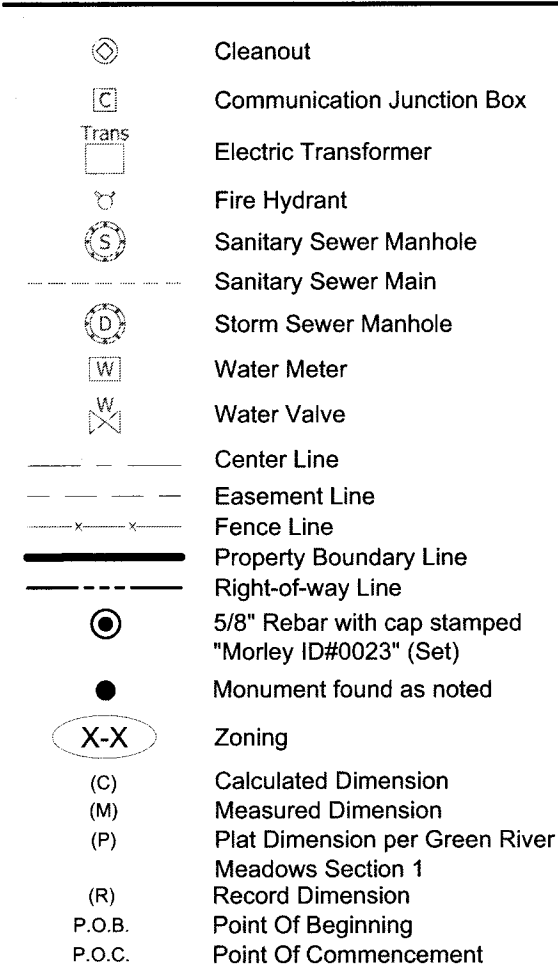
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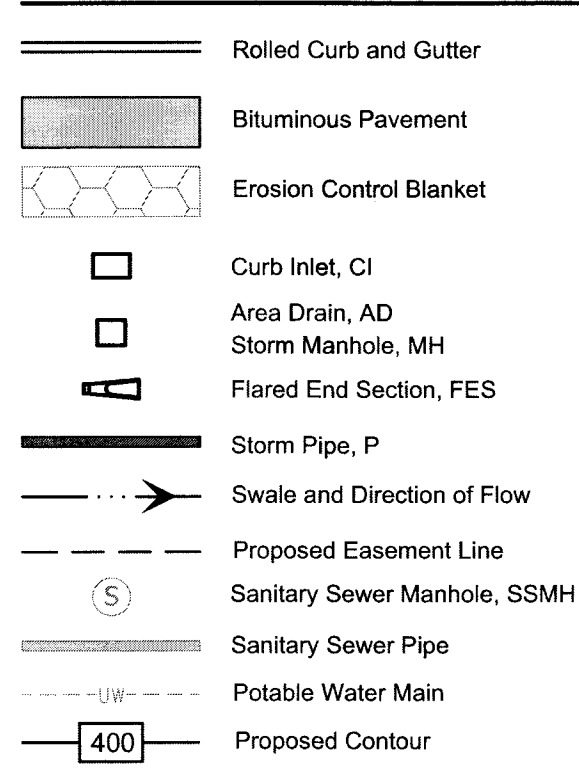
**Design Notes**

- All pipe lengths are measured center of structure to center of structure except pipes ending in flared end sections. Pipes ending in flared end sections shall be measured to the end of the pipe.
- Design pipe slopes are calculated from the center of structure to the center of structure, or end of pipe for flared end sections. Construction pipe slopes may vary slightly if the structure cross slope does not match the design pipe slope. Flared end section slopes shall match design pipe slopes.
- All storm pipes under and within 5 feet of a roadway shall have compacted sand backfill.
- See Sheets C500 and C501 for drainage details.

**Existing Legend**



**Proposed Legend**



**Note:**

No tree limbs, trunks, refuse from legally burnt vegetation, nor construction waste, demolition materials, or other man made material may be buried within the area in which an impounding structure will be located. Notice shall be placed on construction drawings noting the prohibition to the burying of any such materials. Certain natural materials such as large rocks may be located in the bottom of wet basins in order to provide fish habitat or habitat breeding areas provided that such materials are not included within the calculations for required storage volumes and will not block outlet structures.

**Note:**

No downstream restrictions exist within the offsite ditch that lies west of the project property.

**Note:**

Grass mixture for stabilizing open channels shall be a seed mixture applied at a rate of 6.5 pounds of Kentucky 31 Fescue and 1.5 pounds of Perennial Rye per 1000 square feet and have fertilizer with a composition of 12-12-12 applied at a rate of 19 pounds per 1000 square feet. Mulch shall be applied and crimped into place at a rate of 100 pounds per 1000 square feet. When required, turfgrass sod shall be number 1 quality/premium.

**Note:**

Banks of Proposed Detention Basin are to be planted with native grasses and wildflowers (e.g. Milkweed).

**Note:**

The maintenance, repair, and/or replacement of the portion of the curb turnout located outside of street right of way shall be the responsibility of the Lot Owner's Association per Plan A as outlined in the current Vanderburgh County Drainage Ordinance.

**Storm Structure Data Table**

Name	Description	Invert Elevation	AD / MH = Rim CI = FG
CI110	Curb Inlet	389.78	392.91
CI112	Curb Inlet	390.08	392.91
CI302	Curb Inlet	388.78	391.94
CI304	Curb Inlet	388.92	391.94
DCI202	Double Curb Inlet	388.56	391.62
FES 114	Flared End Section	392.72	-
FES100	Flared End Section	388.05	-
FES500	Flared End Section	388.00	-
FES502	Flared End Section	388.05	-
MH102	Manhole	388.09	391.30
MH104	Manhole	388.35	392.12
MH106	Manhole	388.74	392.30
MH108	Manhole	389.75	393.26

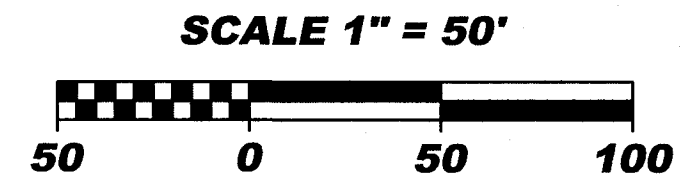
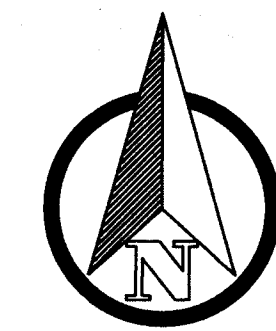
**Storm Pipe Data Table**

Pipe Name	Size and Type	Length	Slope	US IE	DS IE	Start Structure	End Structure
P101	30" Corrugated HDPE Pipe	12.53'	0.30%	388.09	388.05	MH102	FES100
P103	30" Corrugated HDPE Pipe	86.48'	0.30%	388.35	388.09	MH104	MH102
P105	30" RCP	194.22'	0.20%	388.74	388.35	MH106	MH104
P107	24" RCP	253.50'	0.40%	389.75	388.74	MH108	MH106
P109	24" RCP	7.00'	0.40%	389.78	389.75	CI110	MH108
P111	18" RCP	27.00'	1.10%	390.08	389.78	CI112	CI110
P113	15" Corrugated HDPE Pipe	161.36'	1.64%	392.72	390.08	FES 114	CI112
P201	18" RCP	41.47'	0.50%	388.56	388.35	DCI202	MH104
P301	15" RCP	7.00'	0.50%	388.78	388.74	CI302	MH106
P303	12" RCP	27.00'	0.50%	388.92	388.78	CI304	CI302
P501	12" Corrugated HDPE Pipe	15.58'	0.31%	388.05	388.00	FES502	FES500

**Swale Capacity Table**

Side slope = 4  
Average Manning's Coefficient = 0.035 \*Note: Capacity checked at 3:1, but design is for 4:1 typical

Swale	Subbasin no.	Q(100) cfs	Channel Capacity (cfs)	Full Depth Velocity (ft/s)	% of Capacity	Slope (ft/ft)	Slope (%)	Length (ft)	Channel Depth (ft)	Bottom Width (ft)	Wetted Perimeter (ft)	Area (ft <sup>2</sup> )	Hydraulic Radius (ft)	Hydraulic Depth (ft)	Travel Time (min)	US Elev.	DS Elev.	Measures
1.1	Portion of 3	1.90	20.30	4.06	9.4%	0.021	2.06	248.50	1.00	1.00	9.25	5.00	0.54	0.56	1.02	397.85	392.72	Staked Sod
1.2	Portion of 3	3.79	18.67	3.73	20.3%	0.017	1.75	500.00	1.00	1.00	9.25	5.00	0.54	0.56	2.23	401.45	392.72	ECB
2.1	8	4.35	27.58	4.60	15.8%	0.024	2.38	655.18	1.00	2.00	10.25	6.00	0.59	0.60	2.38	405.63	390.04	Staked Sod
2.2	8	4.35	15.97	2.66	27.2%	0.008	0.80	249.35	1.00	2.00	10.25	6.00	0.59	0.60	1.56	390.04	388.05	Staked Sod

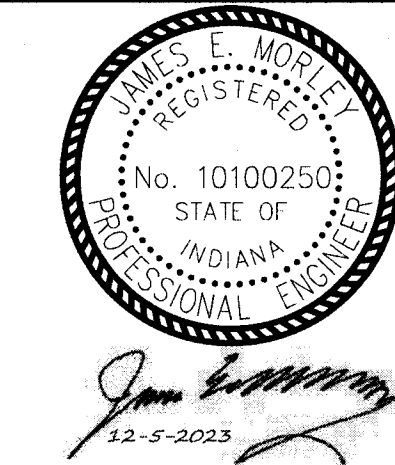


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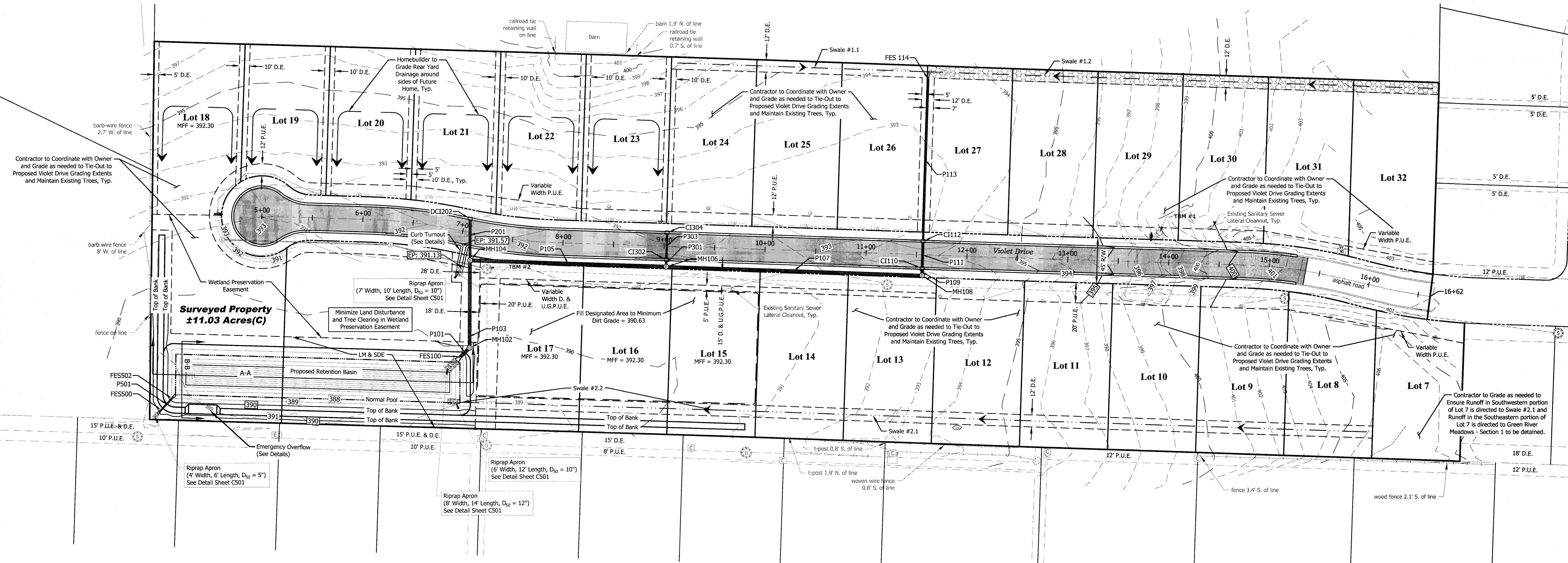
Green River Meadows  
Section 2  
8800 N. Green River Road  
Evansville, IN 47725

**APPROVED**  
DEC 05 2023  
VANDERBURGH COUNTY  
DRAINAGE BOARD

**Drainage Plan**  
Vanderburgh County, IN

No.	By	Date
<b>Revisions</b>		
<b>Scale: 1" = 50'</b>		
Designed By:	JEM	Job Number: 12103.4.001-B
Drawn By:	KJL	Date: 12-5-2023
Filename:	12103 Civil Base	
Sheet Number:	C102	

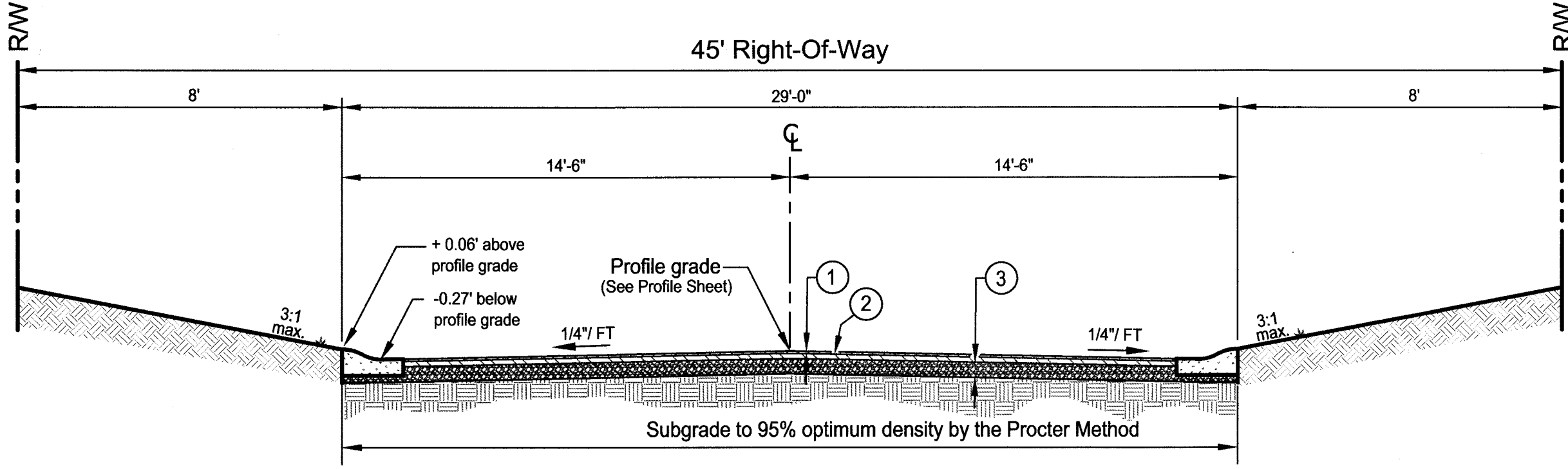
**C102**









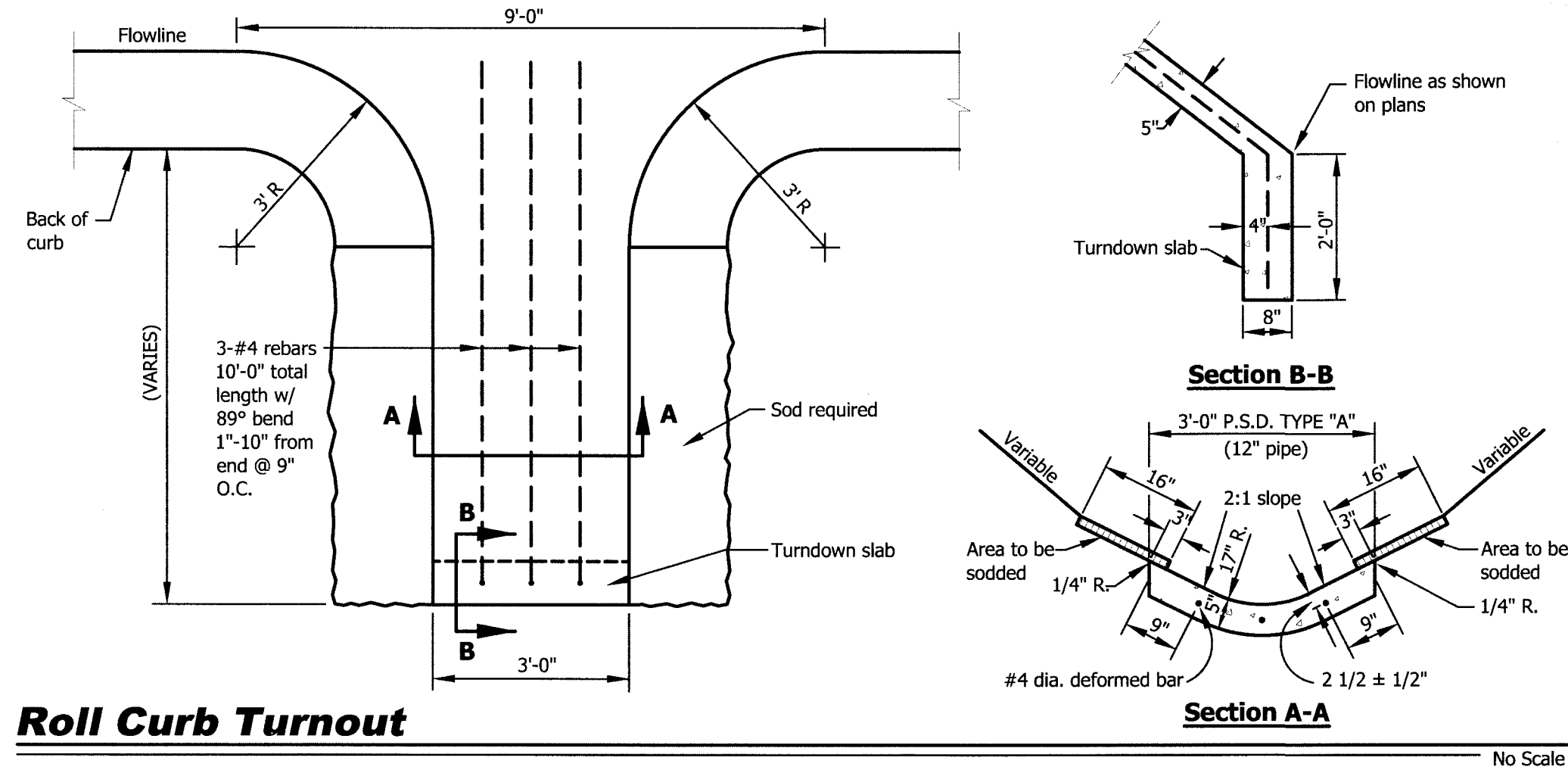


- Asphalt**
- ① 110 lb./Sy HAC Surface, Type B
  - ② 220 lb./Sy HAC Base
  - ③ 6" compacted aggregate base #53

- Notes:**
1. Compaction tests and proofroll are required by the County Engineer. A copy of the compaction test shall be delivered to the owner and the County Engineer's office.
  2. Subgrade must be proof rolled prior to the placement of any stone. Proof rolling shall be done by a fully legally loaded tri-axle dump truck. There shall be 1 or 2 complete coverages as directed. Roller marks, irregularities or failures shall be corrected. Proof rolling must be completed in the presence of a county inspector.
  3. All fill must be constructed in lifts not to exceed six inches.

**29' Residential Bituminous Pavement Section  
Concrete Roll Curb and Gutter in 45' R/W**

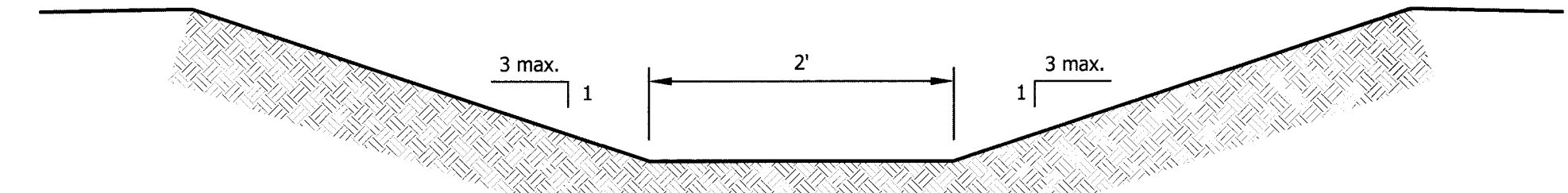
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**Roll Curb and Gutter**

No Scale

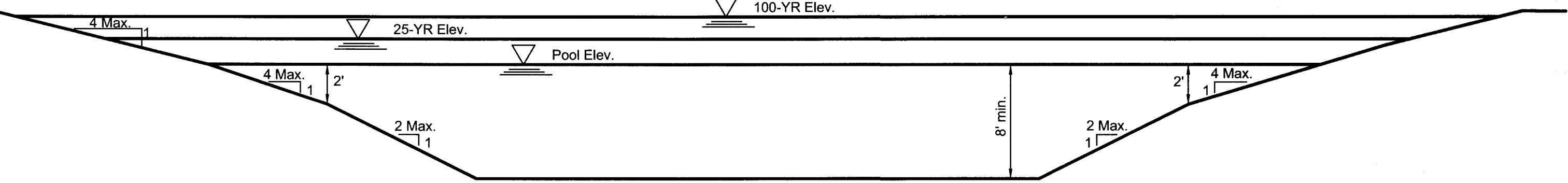
- Notes:**
1. 1/2" Preformed Expansion Joint material at all P.C. & P.T. of Curb Radius.
  2. Tooled Contraction Joints at 10'-0" centers. Contraction Joint to be Minimum 2-1/2" deep and 1/8" wide.



- Notes:**
1. Sod required if longitudinal slope is 4% or greater.
  2. 8"x16" concrete ribbon required if longitudinal slope is less than 0.8%.
  3. Rip-rap or erosion control blanket required on side slopes greater than 3:1. Refer to Erosion/Sediment Control Plan.

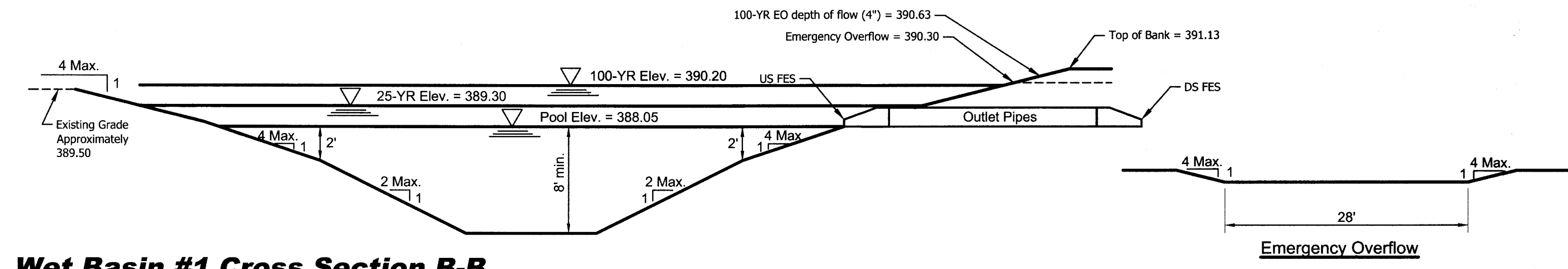
**Typical Swale Cross Section**

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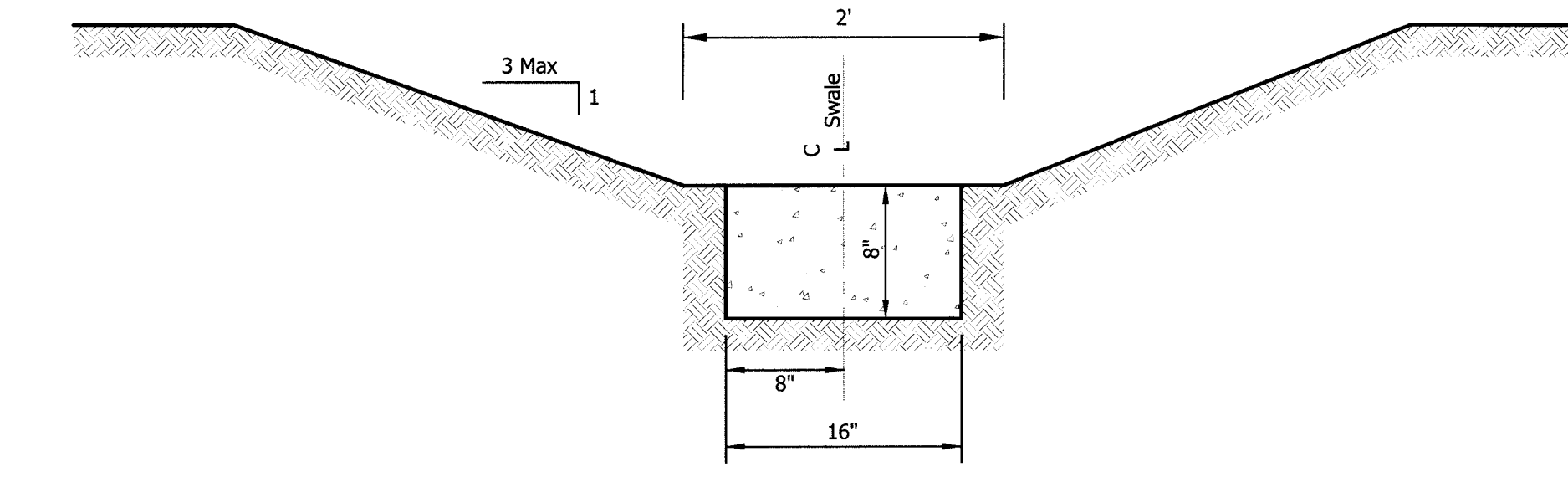
**Wet Basin #1 Cross Section A-A**

No Scale



**Wet Basin #1 Cross Section B-B**

No Scale



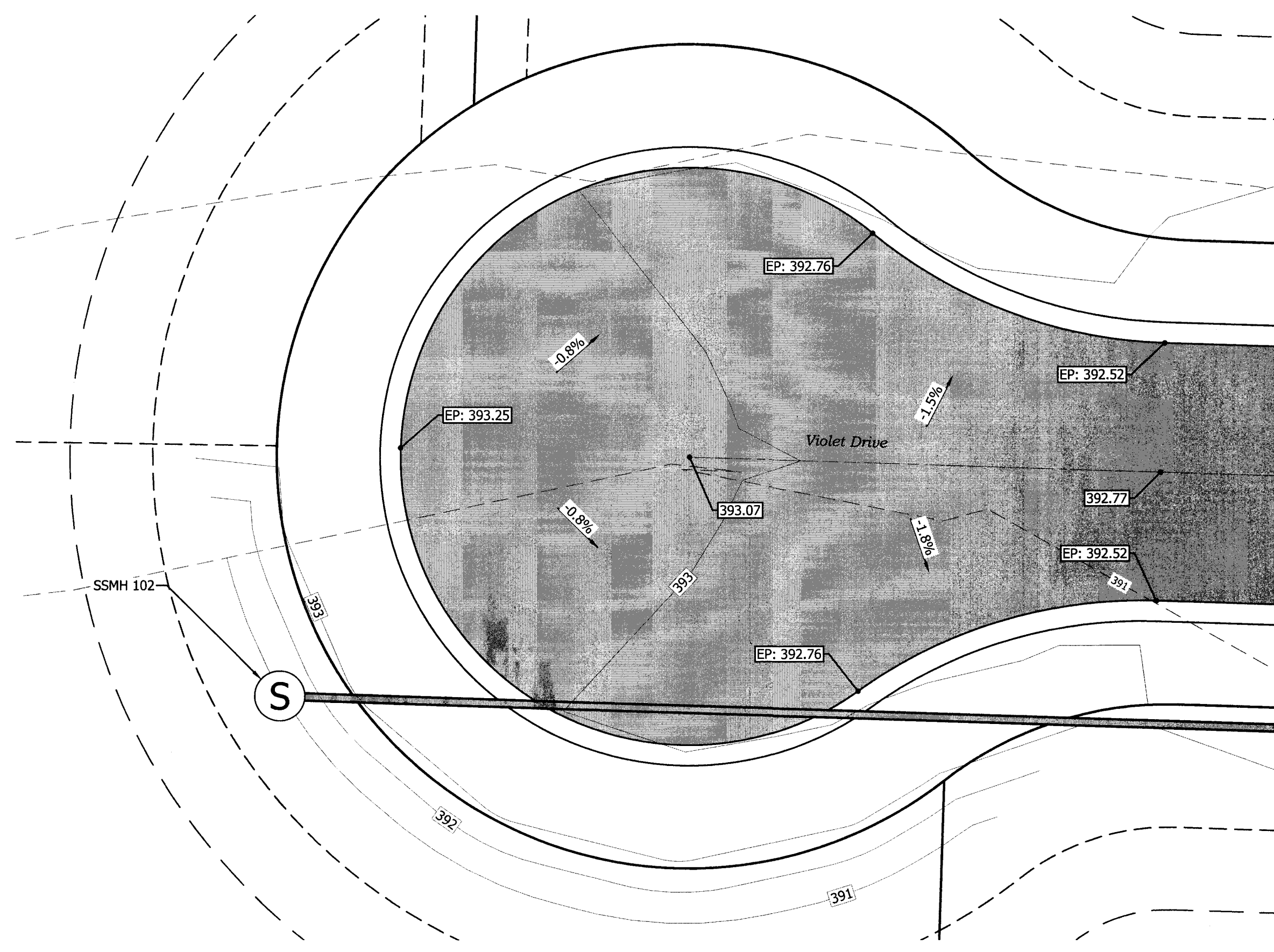
**Typical Concrete Ribbon Swale Cross Section**

No Scale

1. The County Engineer's Office shall be notified at least 24 hours prior to initiating any construction activities.
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3. The contractor is cautioned that the location and/or elevation of existing utilities as shown on these plans is based on records of various utility companies, and where possible measurements taken in the field. The information is not to be relied on as being exact or complete. The contractor must contact the appropriate utility company at least 48 hours before any excavation to request exact field location of utilities. Contractor shall locate existing utilities and establish elevations and clearances with proposed improvements prior to initiating construction.  
**Indiana Underground Utility Locate Service Phone: 811**
4. Material specifications shall be in conformance with applicable portions of the INDOT Standard Specifications, (latest edition) unless specifically stated otherwise on these plans, contract documents or local code.
5. Areas exposed by excavation or stripping and on which subgrade preparations are to be performed shall be scarified to minimum depth of 8" and compacted to minimum of 95% of optimum density, in accordance with ASTM D 698 (or 92% of optimum density, in accordance with ASTM D 1557), at a moisture content of not less than 1% below and not more than 3% above the optimum moisture content. These areas shall then be proofrolled to detect any areas of insufficient compaction. Proofrolling shall be accomplished by making a minimum of two (2) complete passes with a fully-loaded tri-axle dump truck, or approved equivalent, in each of the two perpendicular directions under the supervision and direction of a field geotechnical engineer and a county inspector. Areas of failure shall be excavated and recompacted as stated above. Fill materials used in preparations of subgrade shall be placed in lifts or layers not to exceed 8" loose measure and compacted to a minimum density of 95% of optimum density, in accordance with ASTM D 698, (or 92% of the optimum density, in accordance with ASTM D 1557) at a moisture content of not less than 1% below and not more than 3% above the optimum moisture content.
6. All dirt work graded slopes to be no greater than 3:1, unless otherwise noted on these drawings.
7. Existing ditches located under proposed roadways shall be undercut a minimum of 1'. Cut areas shall not be backfilled until an inspection and approval are given from the local engineers office.

**Roadway General Notes**

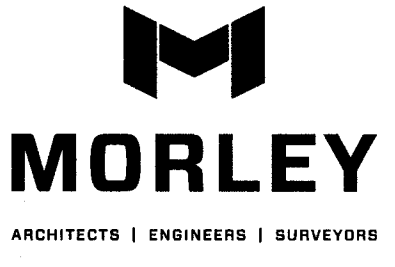
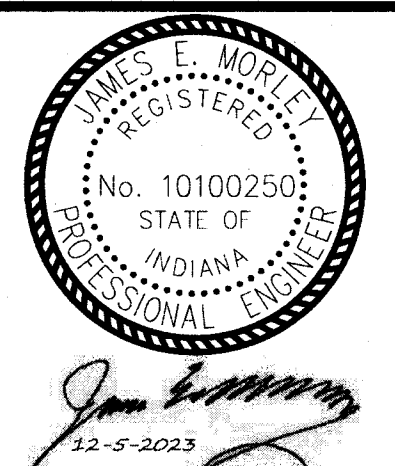
No Scale



**Violet Road Cul-De-Sac Detail**



Scale 1" = 10'



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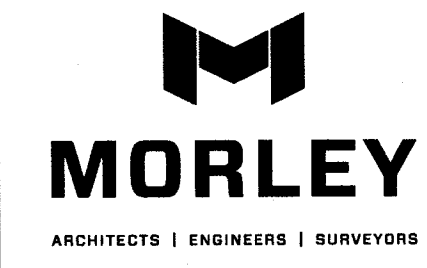
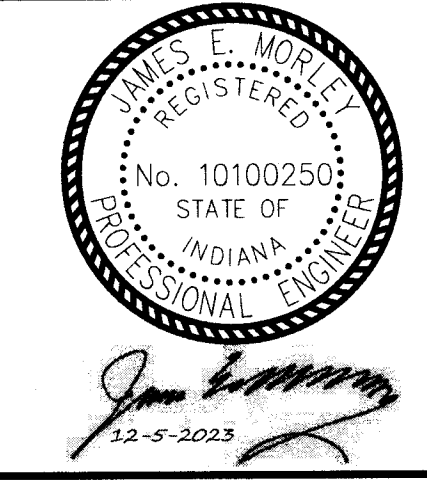
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Green River Meadows  
Section 2  
8800 N. Green River Road  
Evansville, IN 47725

**APPROVED**  
DEC 05 2023  
VANDERBURGH COUNTY  
DRAINAGE BOARD  
**Road and  
Drainage  
Details**  
Vanderburgh County, IN

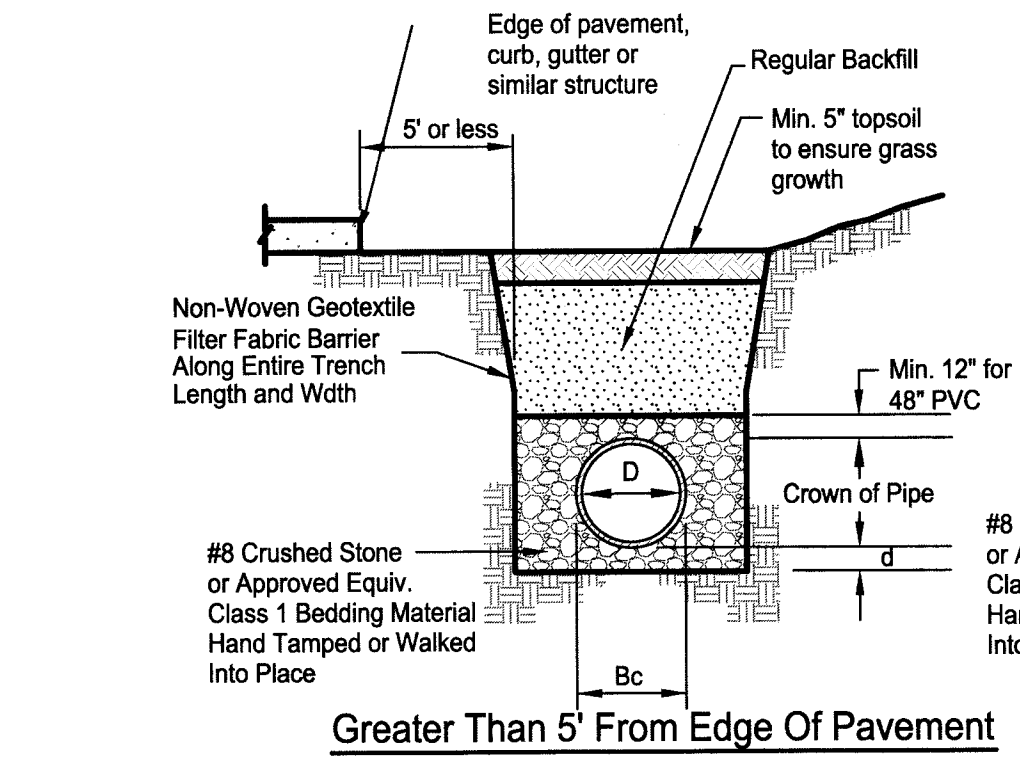
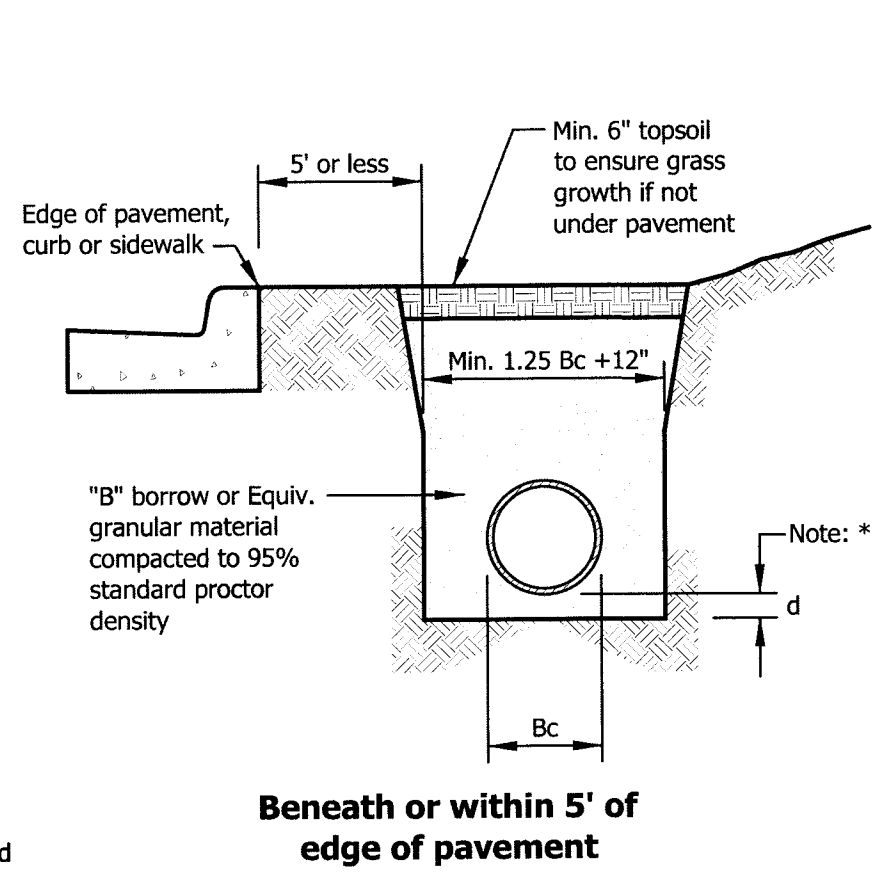
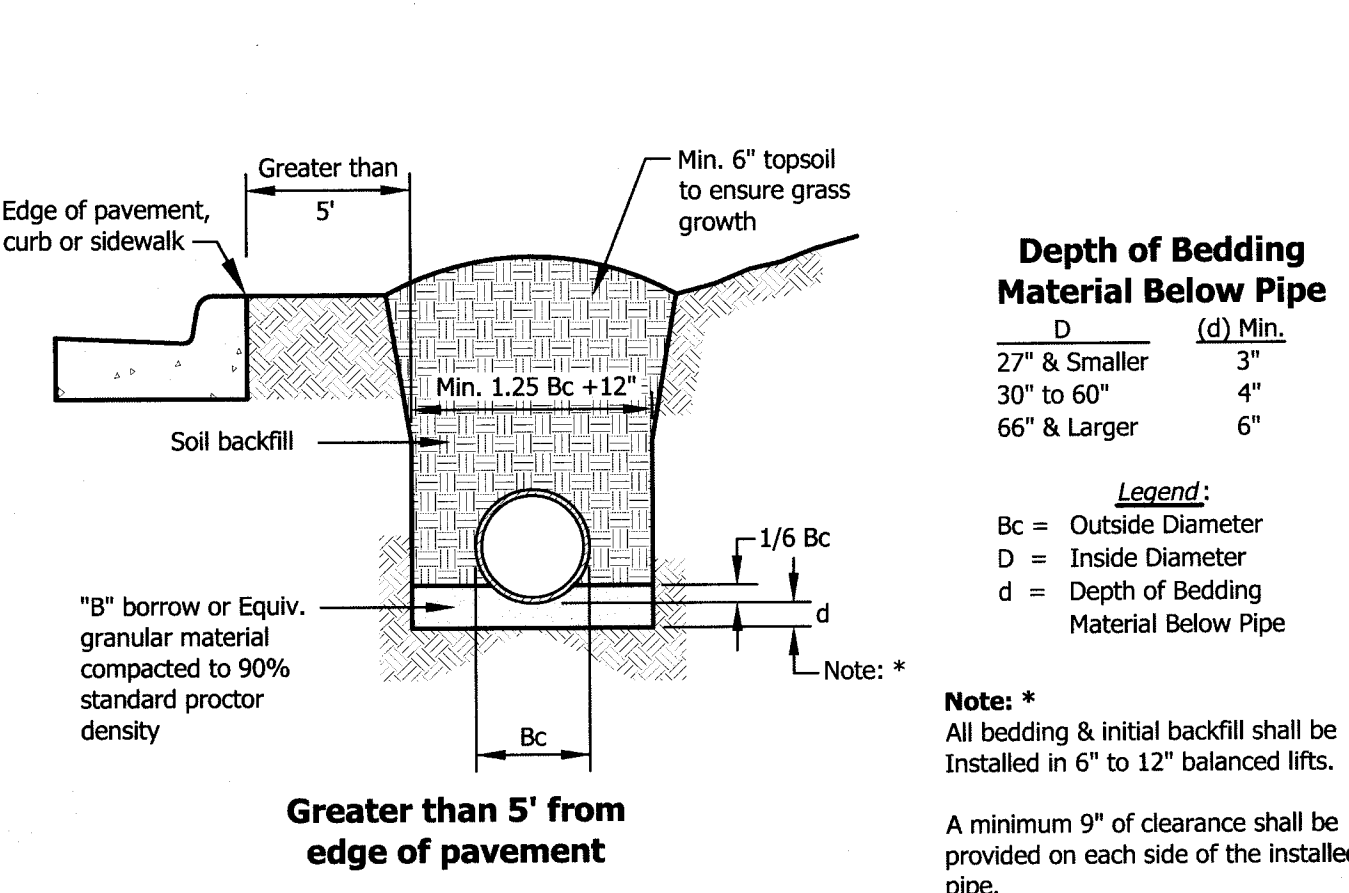
No.	By	Date
<b>Revisions</b>		
<b>Scale: As Noted</b>		
Designed By:	JEM	Job Number: 12103.4.001-B
Drawn By:	K.J.L.	Date: 12-5-2023
Filename:	12103 Civil Base	
Sheet Number:	<b>C500</b>	



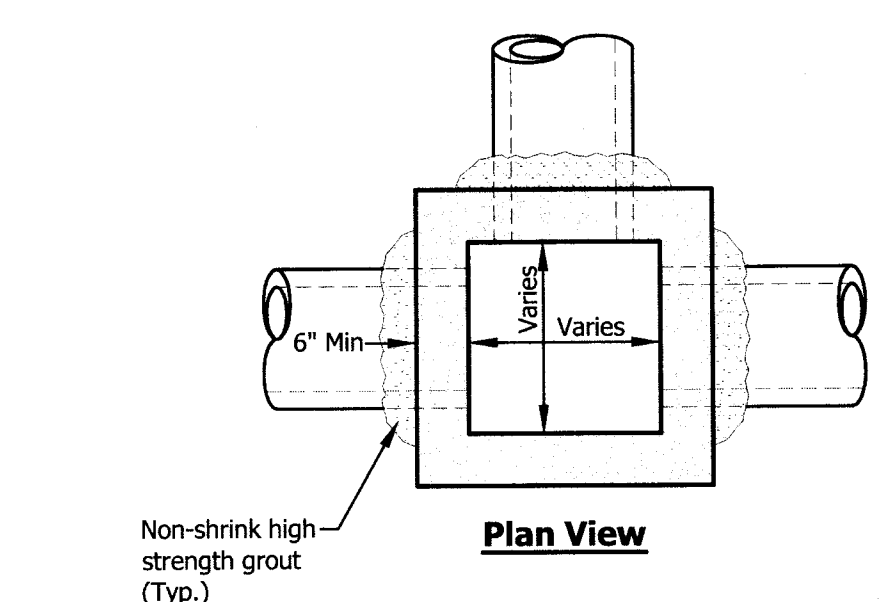
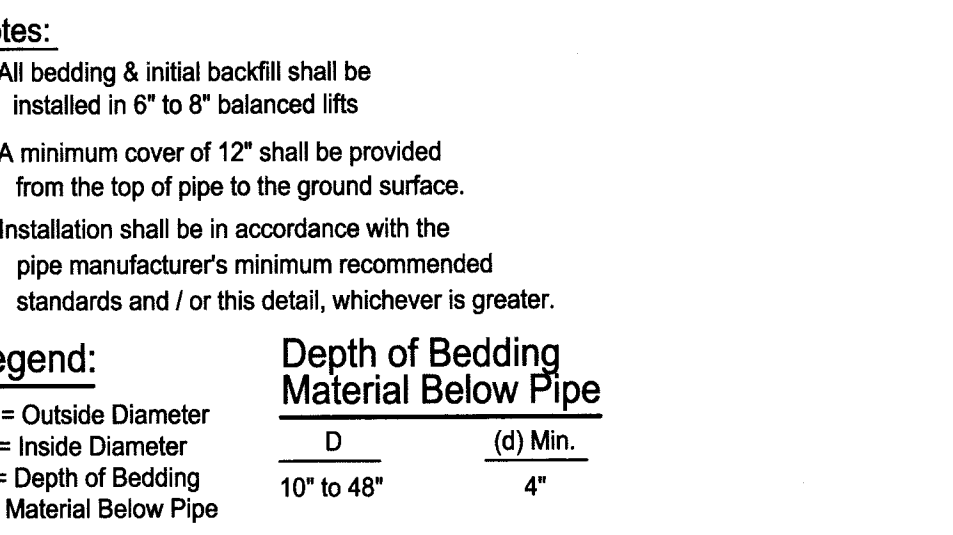


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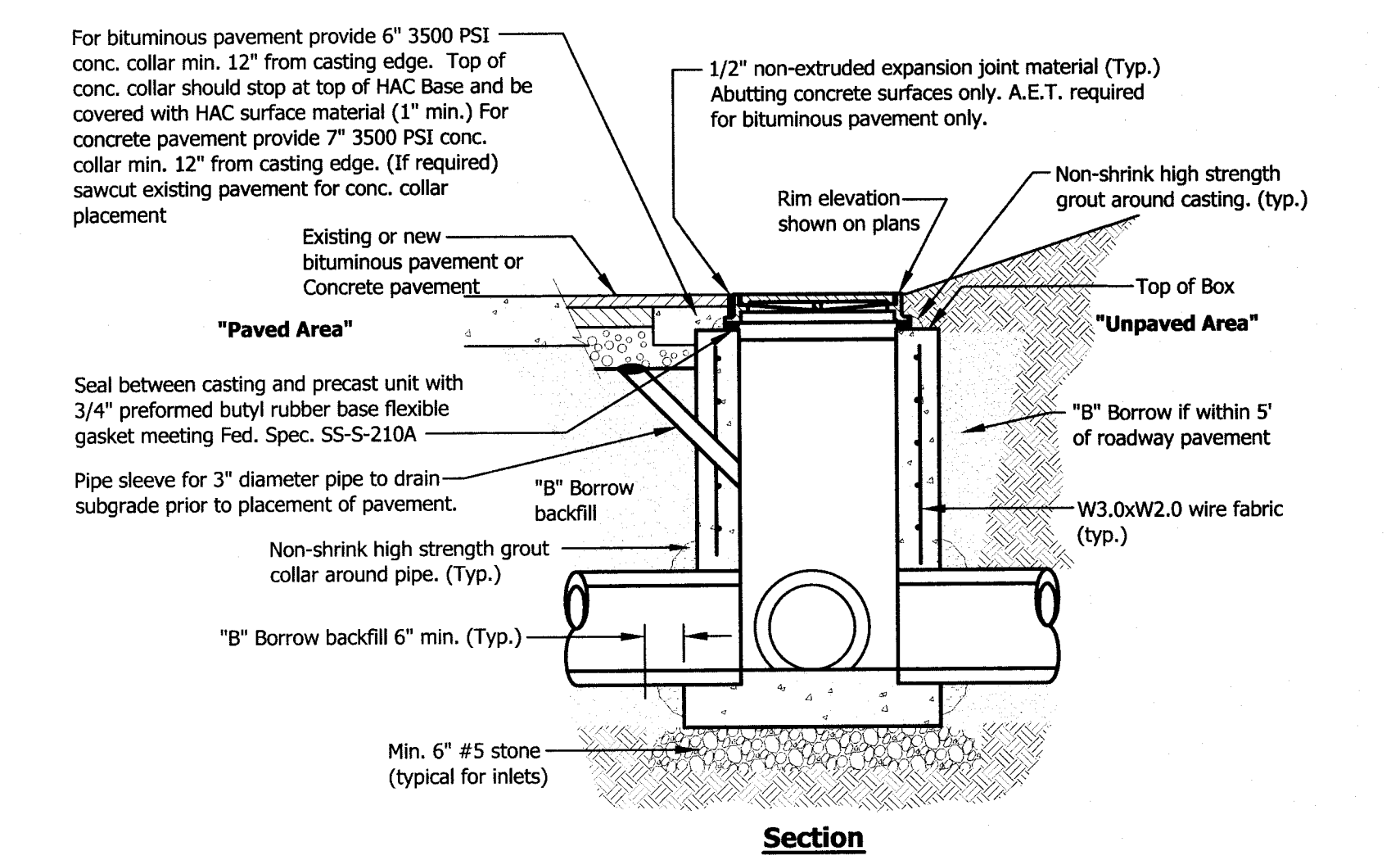
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D	Min. Width
12"	31"
15"	35"
18"	43"
24"	56"
30"	66"
36"	78"
42"	84"
48"	91"
54"	97"
60"	103"



- Notes:**
- For Area Inlet in pavement East Jordan #8306 casting or equal with Type M grate. For Area Inlet in non-paved areas: East Jordan #6500 casting, or equal, with adapter ring.
  - For Manhole East Jordan #8306 casting with Type A solid cover or equal. Contractor may substitute East Jordan #1022-1 casting with Type A solid cover, or equal.
  - All connecting pipes shall be grouted with a high strength non-shrink grout.
  - Precast box shall conform to ASTM C-478.
  - Reinforcement shall be 3" x 6" W3.0xW2.0 wire fabric for precast units.
  - The inlet shall be backfilled with "B" Borrow and mechanically compacted in 6" lifts to 95% of standard density ASTM 698.

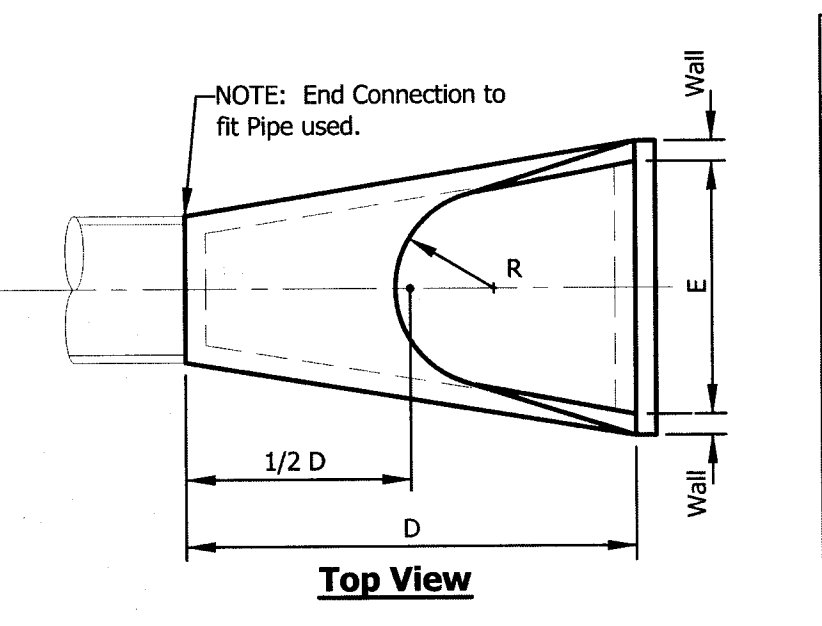
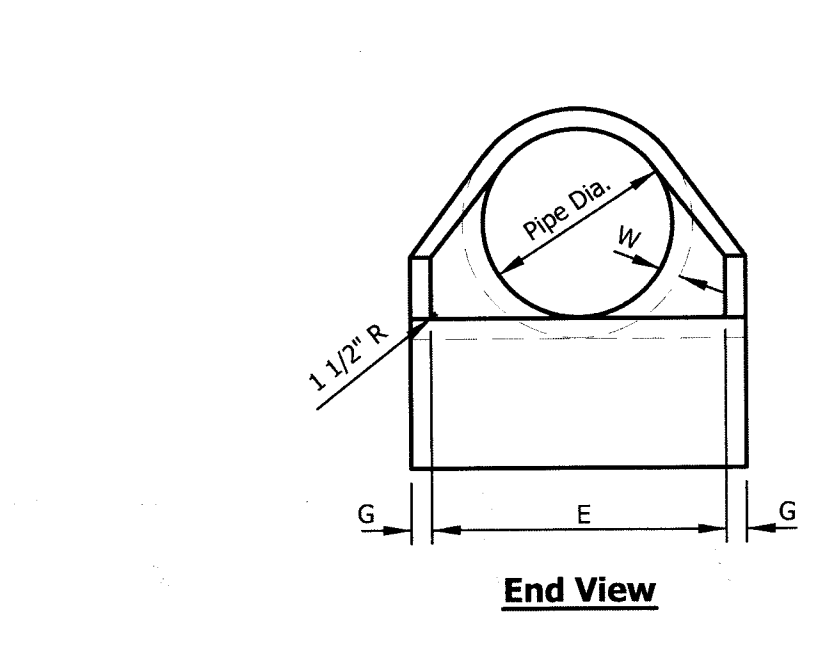
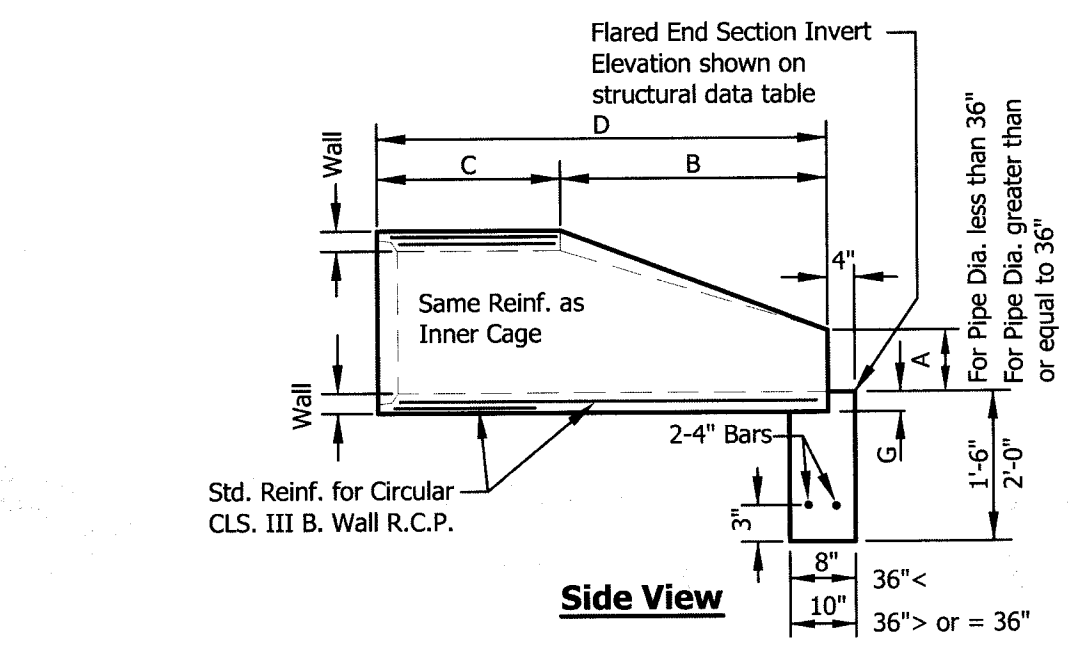


**Storm Manhole - Precast Box**

No Scale

**Reinforced Concrete Pipe Storm Sewer Bedding (Circular and Elliptical)**

No Scale

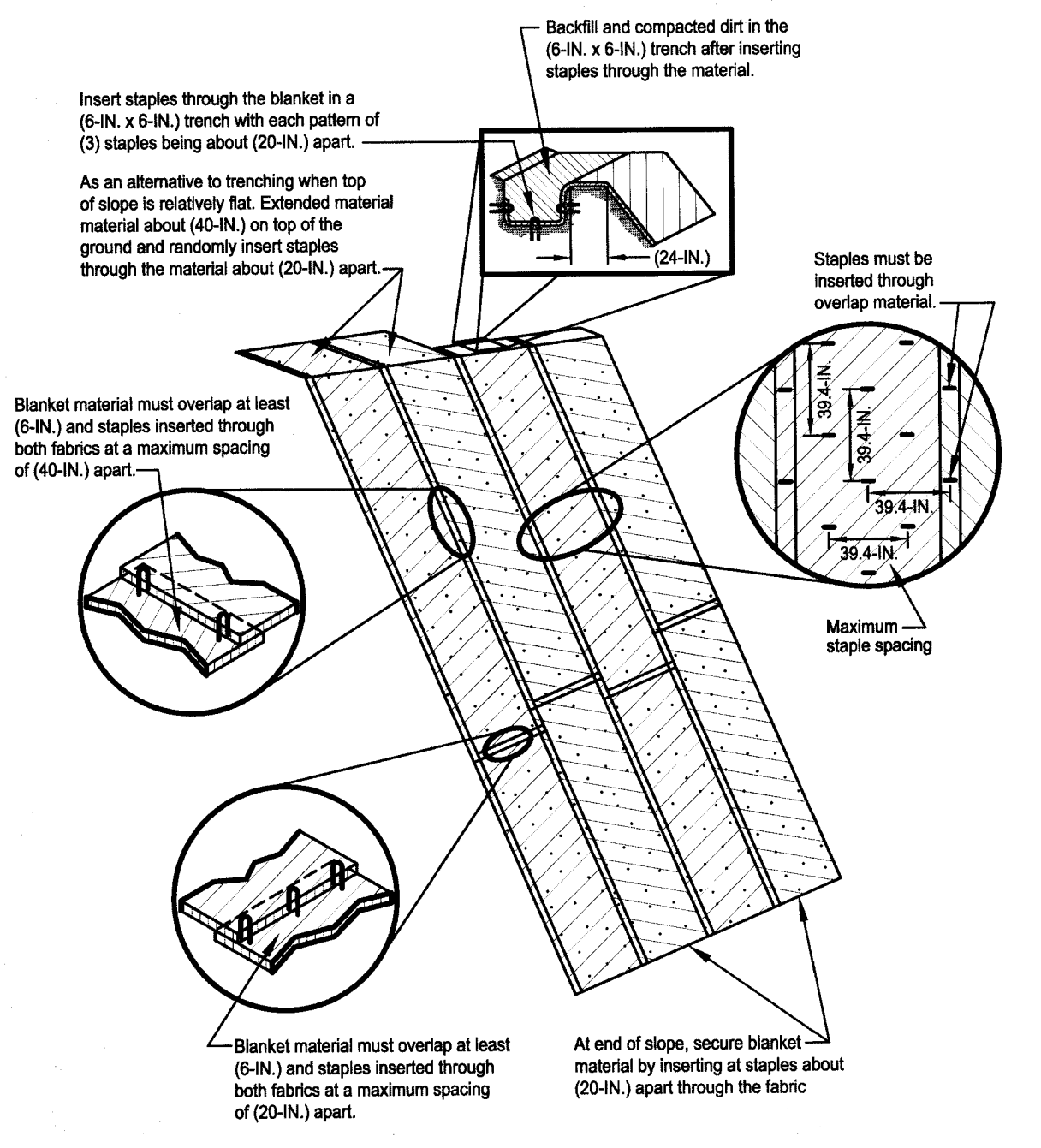


PIPE DIA.	WGT. (LBS.)	WALL	A	B	C	D	E	G	R	SLOPE
12"	530	2 1/4"	8"	2'-1/4"	4'-1 1/2"	6'-1 3/4"	1'-11 3/4"	2 1/4"	9"	2:1
15"	900	2 1/4"	9"	2'-3"	3'-10"	6'-1"	2'-6"	2 1/4"	11"	2:1
18"	1000	2 1/2"	11 1/2"	2'-3"	3'-10"	6'-1"	3'-0"	2 1/2"	1'-0"	2:1
21"	1280	2 3/4"	10"	2'-11"	3'-2"	6'-1"	3'-6"	2 3/4"	1'-1"	2:1
24"	1600	2 3/4"	1'-0"	3'-8"	2'-6"	6'-2"	4'-0"	2 3/4"	1'-2"	2:1
27"	1930	3 1/4"	10 1/2"	4'-0"	2'-1 1/2"	6'-1 1/2"	4'-6"	3 1/4"	1'-2 1/2"	3:1
30"	2250	3 1/2"	1'-0"	4'-6"	1'-7 3/4"	6'-1 3/4"	5'-0"	3 1/2"	1'-3"	3:1
33"	3200	3 3/4"	1'-1 1/2"	4'-10 1/2"	3'-3 1/4"	8'-1 3/4"	5'-6"	3 3/4"	1'-5 1/2"	3:1
36"	4480	4"	1'-4 3/4"	5'-3"	2'-10 3/4"	8'-1 3/4"	6'-0"	4"	1'-8"	3:1
42"	5380	4 1/2"	1'-9"	5'-3"	2'-11"	8'-2"	6'-4"	4 1/2"	1'-10"	3:1
48"	6550	5"	2'-0"	6'-0"	2'-2"	8'-2"	7'-0"	5"	1'-10"	3:1
54"	8240	5 1/2"	2'-3"	5'-5"	2'-11"	8'-4"	7'-6"	5 1/2"	2'-0"	2:1
60"	8730	6"	2'-11"	5'-0"	3'-3"	8'-3"	8'-0"	5"	*	2:1
66"	10710	6 1/2"	2'-6"	6'-0"	2'-3"	8'-3"	8'-6"	5 1/2"	*	2:1
72"	12520	7"	3'-0"	6'-6"	1'-9"	8'-3"	9'-0"	6"	*	1.86:1
78"	14770	7 1/2"	3'-0"	7'-6"	1'-9"	9'-3"	9'-6"	6 1/2"	*	1.82:1
84"	18160	8"	3'-0"	7'-6 1/2"	1'-9"	9'-3 1/2"	10'-0"	6 1/2"	*	1.5:1

**Concrete End Section**

No Scale

\*Refer to Reinforced Concrete Pipe (Circular and Elliptical) Storm Sewer Bedding detail for bedding requirements



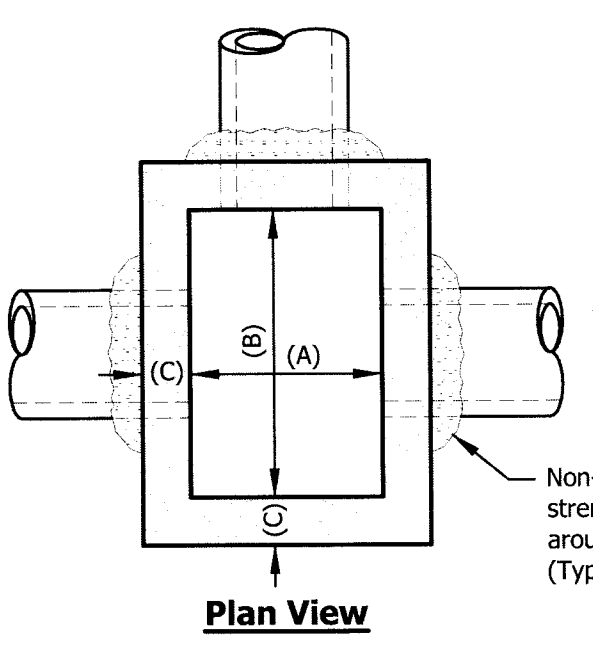
**Erosion Control Blanket (North American Green SC-150 or Equivalent)**

No Scale

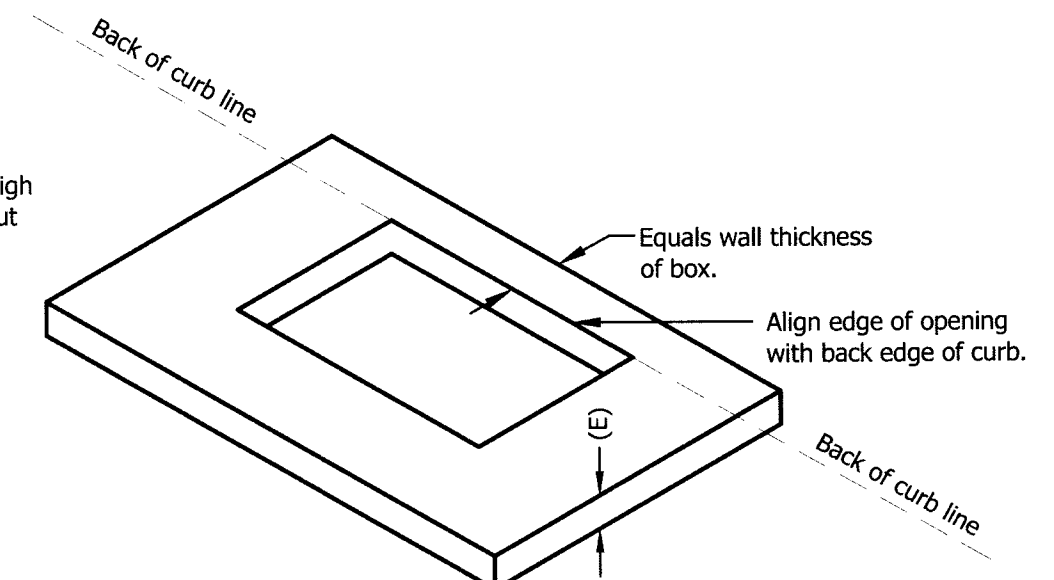
**HDPE Pipe Bedding**

No Scale

- 13.04.300 (F) Deflection Testing Flexible Pipe.
- All storm sewer constructed of flexible pipe, including pipe manufactured from Polyvinyl Chloride (PVC), High Density Polyethylene (HDPE), and Corrugated Metal Pipe (CMP), shall be inspected or tested for deflection in accordance with the following:
    - Pipes sized thirty-six (36) inches or smaller in diameter, which cannot be inspected and measured for deflection with video cameras, visual inspection, or manual measurement to the satisfaction of the County Engineer to determine less than five percent (5%) deflection, shall be tested using a mandrel.
    - The mandrel shall be pulled by hand without mechanical assistance, and the mandrel test shall be a "go/no-go" procedure.
    - The mandrel shall be approved by the County Engineer or his or her authorized representative prior to use to certify that the mandrel is rigid, nonadjustable, has an odd number of legs not less than nine (9), and has a length not less than its nominal diameter.
    - The diameter of the mandrel at any point shall not be less than the allowed percentage of deflection of the certified actual mean inside diameter of the pipe being tested.
    - The mandrel shall be fabricated of metal, fitted with pulling rings at each end, stamped or engraved on some segment other than a runner with the nominal pipe size and the mandrel's outside diameter.
    - For any vertical or horizontal deflection test, pipe failure shall be defined as five percent (5%) or greater deflection of the tested pipe's internal diameter.
    - The Project Site Owner/Operator shall perform, or shall cause to be performed, all required deflection tests no sooner than thirty (30) days after final backfill has been placed over the pipe to be tested.
    - Pipe inspection and test methods, procedures, and equipment, whether conducted or employed for mandrel testing or other inspections necessary to comply with this section, shall be subject to the County Engineer's approval, and all tests and inspections must be conducted in the presence of the County Engineer or his or her authorized representative.
    - The pipe inspection and test results must be reviewed and certified by the County Engineer or his or her authorized representative prior to final acceptance or release of the storm sewer facilities and applicable portion of the letter of credit covering the storm sewer and associated improvements.
    - All flexible pipe failing the deflection test within the warranty period shall be replaced or caused to be replaced by the project site owner or operator at no cost to the County.
    - For flexible pipes larger than 36 inches diameter, inspection, measurement, and determination of deflection shall be achieved by methods and procedures approved by the County Engineer.

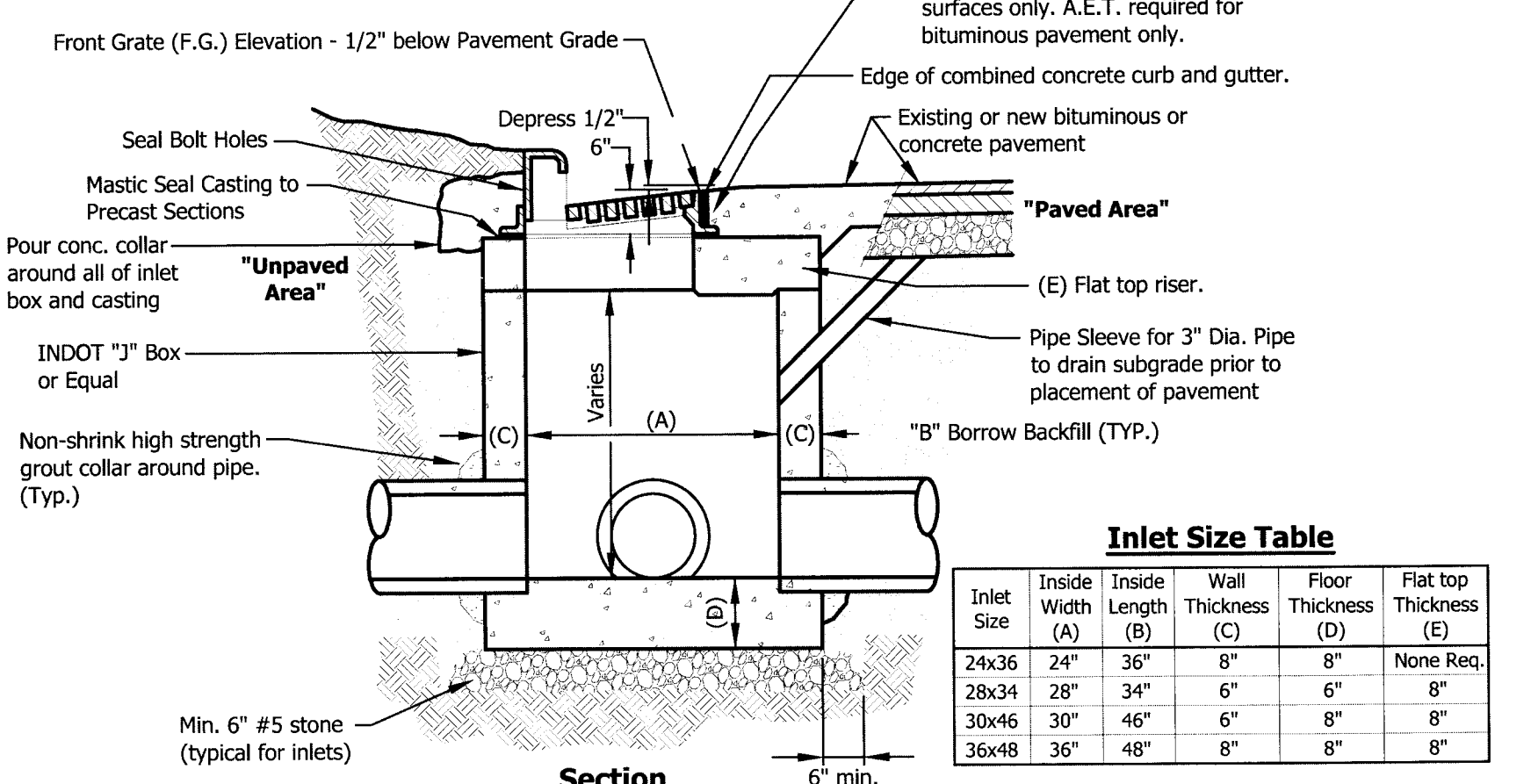


- Notes:**
- East Jordan Iron Works, Inc. (or approved equal) #7030 catch basin curb inlet, with M3 grate for valley inlets or M4 grate for slope inlets. Type T-1 back for straight curbs.
  - All connecting pipe shall be grouted with a high strength non-shrink grout.
  - Precast units shall conform to ASTM C-478.
  - The inlet shall be backfilled with "B" Borrow and mechanically compacted in 6" lifts to 95% of standard density ASTM-698.



**Flat Top Riser for Curb Inlets**

\* Opening in top shall be centered on box for Manholes and Area Drains



**Inlet Size Table**

Inlet Size	Inside Width (A)	Inside Length (B)	Wall Thickness (C)	Floor Thickness (D)	Flat top Thickness (E)
24x36	24"	36"	8"	8"	None Req.
28x34	28"	34"	6"	6"	8"
30x46	30"	46"	6"	8"	8"
36x48	36"	48"	8"	8"	8"

**Curb Inlet**

No Scale

**Apron Note:**

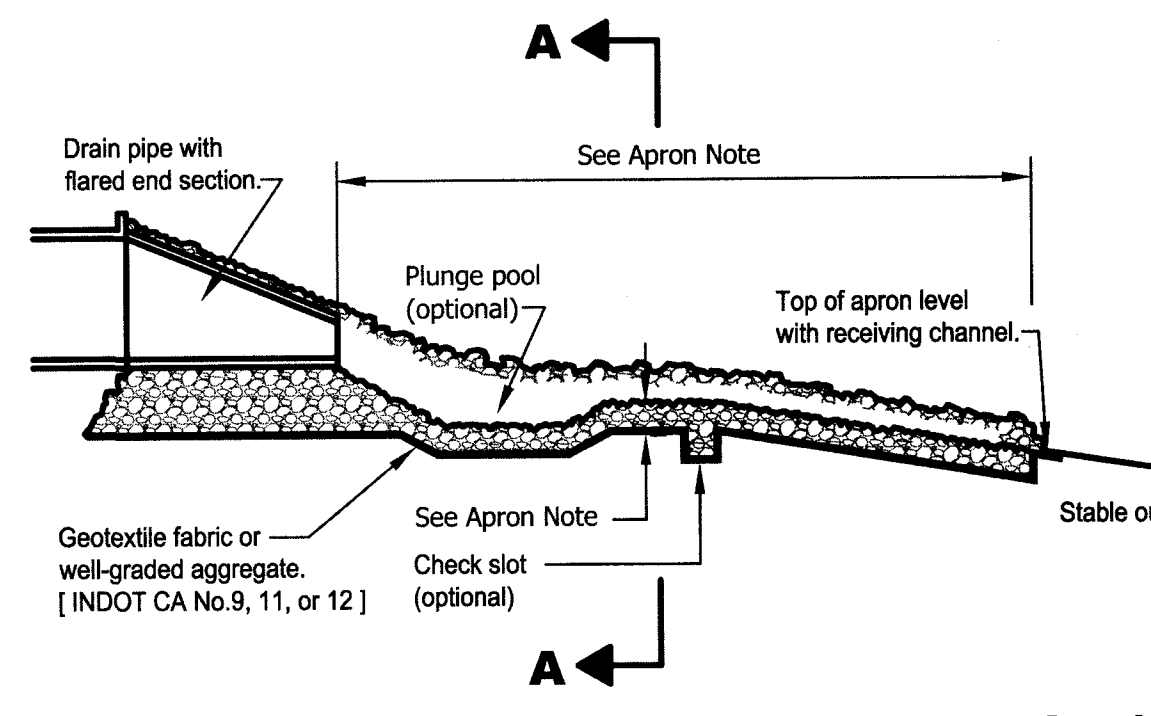
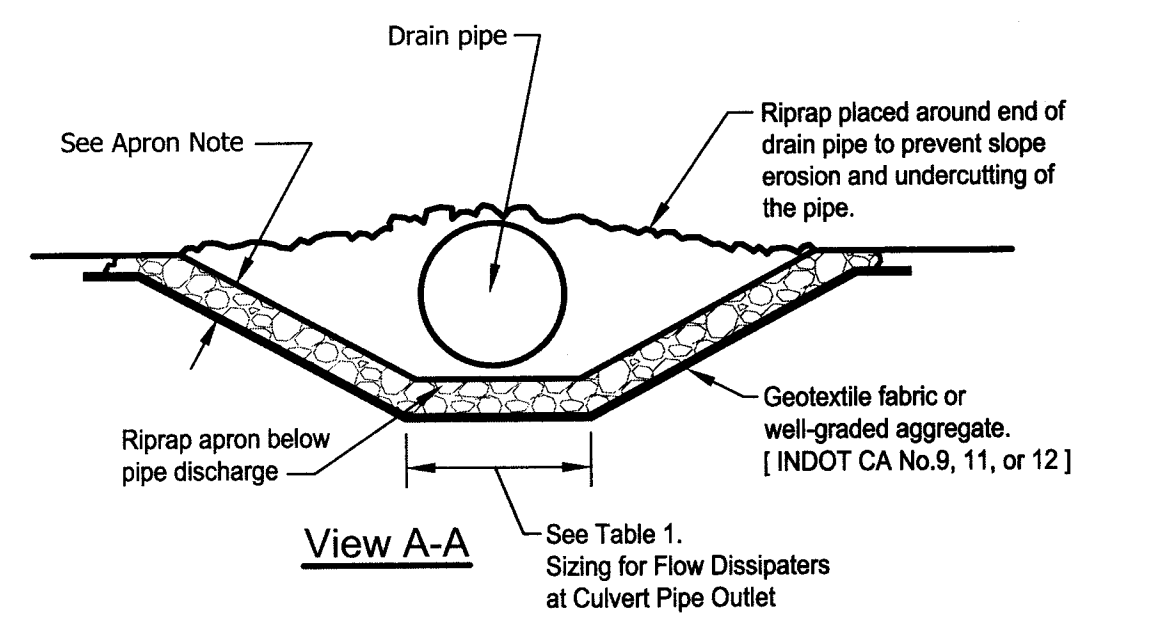
- Length and width determined according to tailwater conditions.
- Aligned straight with channel flow. If curve is necessary to align apron with the receiving stream, locate the curve in the upstream section of the apron.
- Plunge pool (used with higher velocity flows).
- Thickness
  - 1.2 times the maximum stone diameter for a  $d_{50}$  stone size of 15 inches or larger.
  - 1.5 times the maximum stone diameter for a  $d_{50}$  stone size of 15 inches or less.

**Table 1. Sizing for Flow Dissipaters at Culvert Pipe Outlets**

Pipe Size	Average Riprap Diameter	Apron Width <sup>2</sup>	Apron Length <sup>3</sup>
8 in.	3 in.	2 to 3 ft.	5 to 7 ft.
12 in.	5 in.	3 to 4 ft.	6 to 12 ft.
18 in.	8 in.	4 to 6 ft.	8 to 18 ft.
24 in.	10 in.	6 to 8 ft.	12 to 22 ft.
30 in.	12 in.	8 to 10 ft.	14 to 28 ft.
36 in.	14 in.	10 to 12 ft.	16 to 32 ft.

- Riprap**
- Hard, angular, highly weather resistant.
  - Specific gravity of at least 2.5.
  - Size and gradation that will withstand velocities of storm water discharge flow design.
  - Well-graded mixture of stone with 50 percent of the stone pieces, by weight, larger than the  $d_{50}$  size and diameter of the largest stone equal to 1.5 times the  $d_{50}$  size.

- For larger or higher flows consult a registered engineer.
- Apron width at the narrow end of apron (pipe or channel outlet).
- Select length taking into consideration the low flow (no pressure head) or high flow (pressure head) conditions of the culvert pipe.



**Energy Dissipater (Outlet Protection)**

No Scale

Green River Meadows  
Section 2  
8800 N. Green River Road  
Evansville, IN 47725

**APPROVED**

DEC 05 2023  
VANDERBURGH COUNTY  
DRAINAGE BOARD

**Drainage Details**  
Vanderburgh County, IN

No.	By	Date
<b>Revisions</b>		
Scale: As Noted		
Designed By:	JEM	Job Number: 12103.4.001-B
Drawn By:	K.J.L.	Date: 12-5-2023
Filename:	12103 Civil Base	
Sheet Number:	C501	