
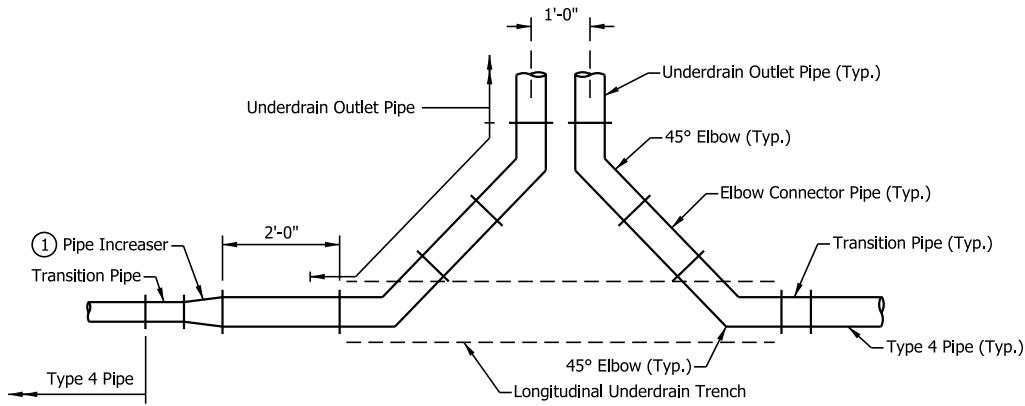


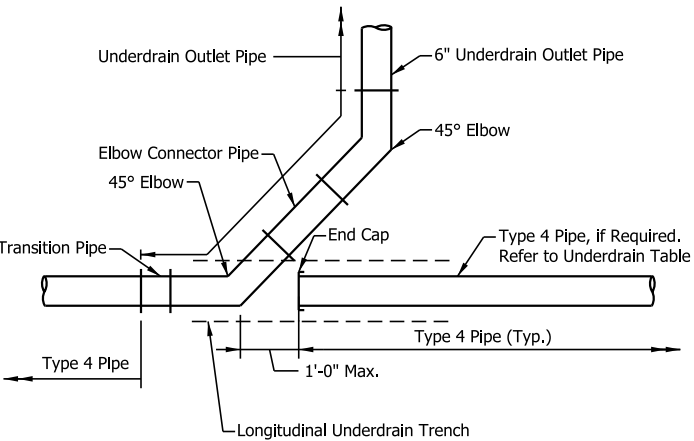
INDEX	
SHEET NO.	SUBJECT
1	Underdrain Drawing Index and General Notes
2	Underdrain Details
3	Underdrain Details
4	Outlet Protector, Type 1
5	Outlet Protector, Type 2
6	Outlet Protector, Type 3
7	Outlet Protector Rodent Screen

APPROXIMATE OUTLET PROTECTOR QUANTITIES			
TYPE	CONCRETE, CLASS A (cys)	REINFORCING BARS (lb)	SODDING (sys)
1	0.8	29	4.9
2	0.6	25	4.0
3	0.3	22	3.2

INDIANA DEPARTMENT OF TRANSPORTATION	
UNDERDRAIN DRAWING INDEX AND GENERAL NOTES	
SEPTEMBER 2017	
STANDARD DRAWING NO. E 718-UNDR-01	
	<i>/s/ Elizabeth W. Phillips</i> 08/26/16 DESIGN STANDARDS ENGINEER DATE
	<i>/s/ Mark A. Miller</i> 09/19/16 CHIEF ENGINEER DATE



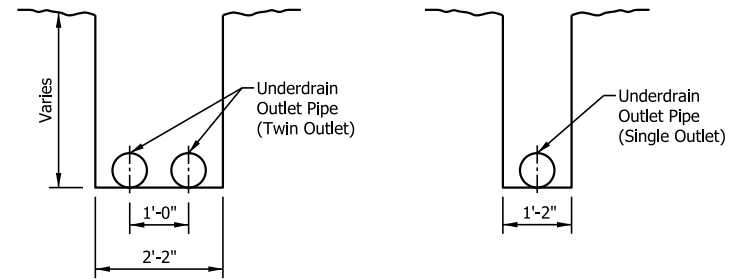
TWIN OUTLET DETAIL-PLAN VIEW



SINGLE OUTLET DETAIL-PLAN VIEW

NOTE:

- ① If the underdrain pipe and the outlet pipe are of different sizes an increaser of the same material as the outlet pipe shall be installed 2 ft from the transition pipe and the 45° elbow.



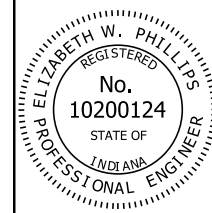
OUTLET TRENCH DETAILS

INDIANA DEPARTMENT OF TRANSPORTATION

UNDERDRAIN DETAILS

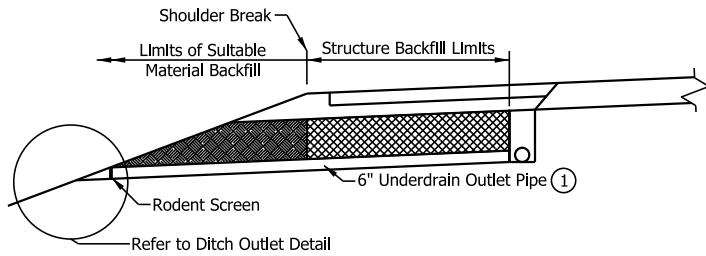
SEPTEMBER 2017

STANDARD DRAWING NO. E 718-UNDR-02

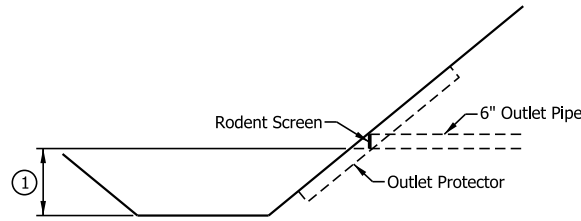


/s/ Elizabeth W. Phillips 08/26/16
DESIGN STANDARDS ENGINEER DATE

/s/ Mark A. Miller 09/19/16
CHIEF ENGINEER DATE



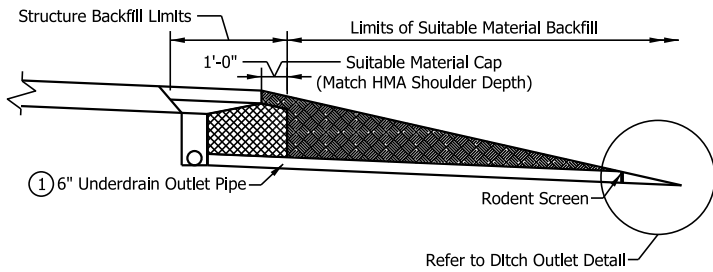
OUTSIDE SHOULDER INSTALLATION



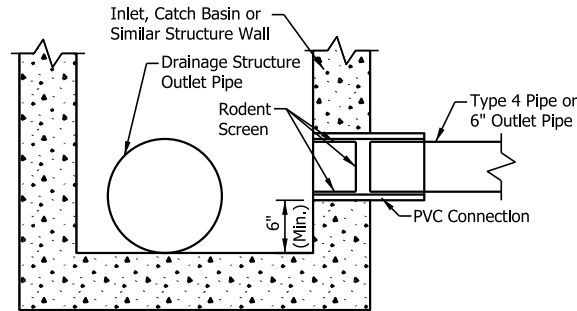
DITCH OUTLET DETAIL

NOTE:

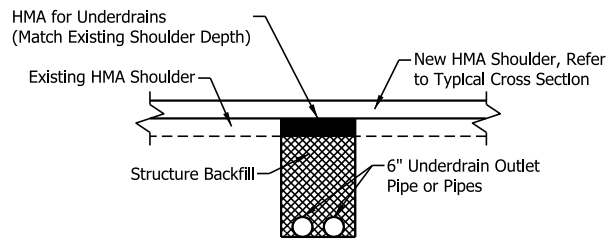
- ① If underdrain outlet pipe elevations are not shown on Underdrain Table, the minimum outlet pipe slope shall be 0.3%. The minimum freeboard between the outlet pipe outfall and the ditch line shall be 1'-0" for median ditches and 2'-0" for side ditches.



MEDIAN SHOULDER INSTALLATION

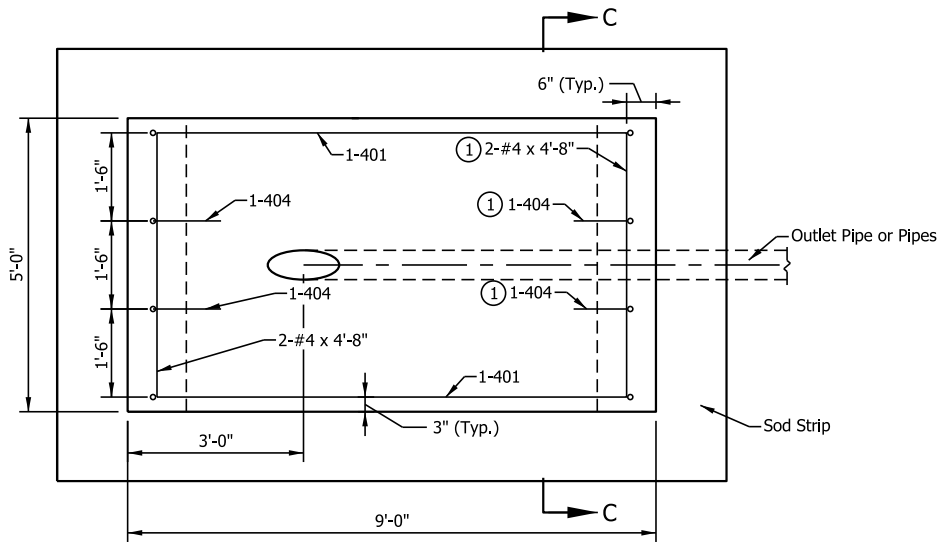


DRAINAGE STRUCTURE OUTLET DETAIL

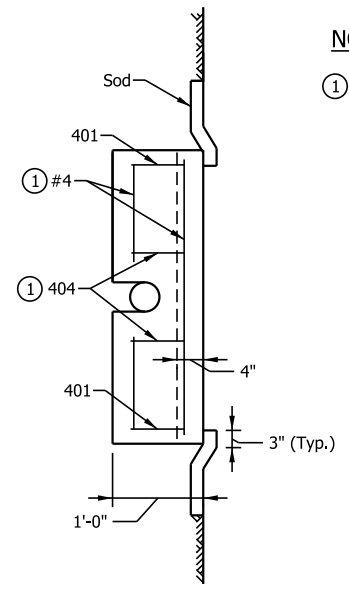


RETROFIT UNDERDRAIN OUTLET DETAIL (UNDER PAVED SHOULDER)

INDIANA DEPARTMENT OF TRANSPORTATION	
UNDERDRAIN DETAILS	
SEPTEMBER 2017	
STANDARD DRAWING NO. E 718-UNDR-03	
	<i>/s/ Elizabeth W. Phillips</i> 08/26/16 <small>DESIGN STANDARDS ENGINEER DATE</small>
	<i>/s/ Mark A. Miller</i> 09/19/16 <small>CHIEF ENGINEER DATE</small>



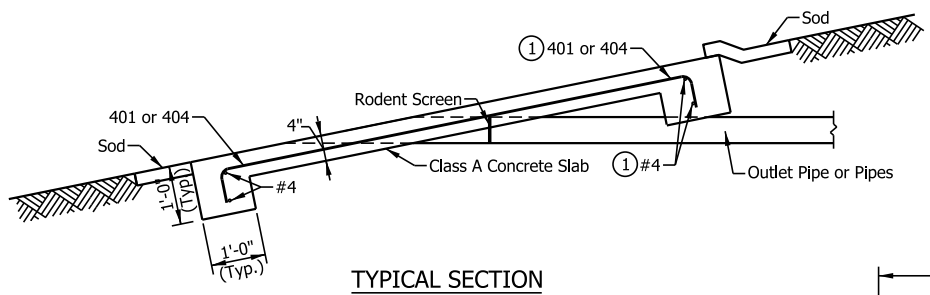
PLAN VIEW



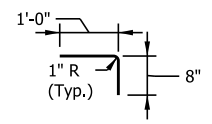
SECTION C-C

NOTE:

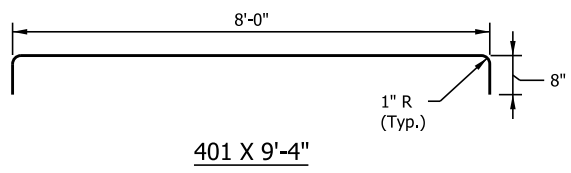
- ① The #4 transverse bars in the upslope lug may be field cut to accommodate the outlet pipe or pipes. The 404 bars in the upslope lug may be moved to accommodate the outlet pipe or pipes.



TYPICAL SECTION

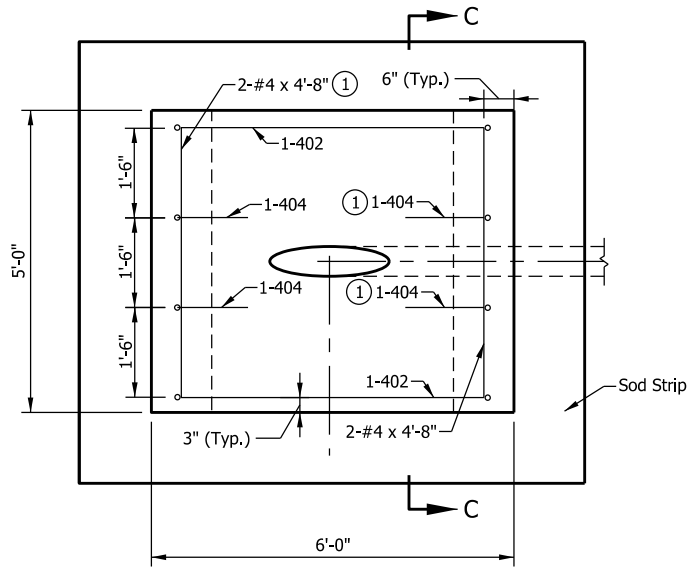


404 x 1'-8"

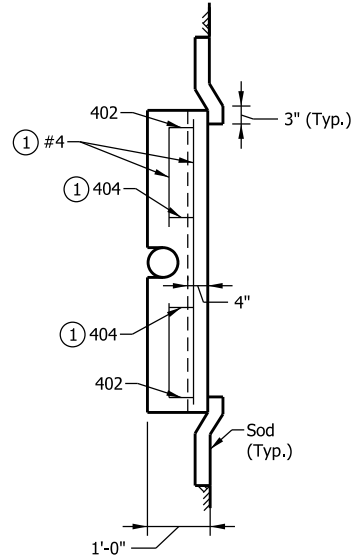


401 X 9'-4"

INDIANA DEPARTMENT OF TRANSPORTATION	
OUTLET PROTECTOR, TYPE 1	
SEPTEMBER 2017	
STANDARD DRAWING NO. E 718-UNDR-04	
	<i>/s/ Elizabeth W. Phillips</i> 08/26/16 DESIGN STANDARDS ENGINEER DATE
	<i>/s/ Mark A. Miller</i> 09/19/16 CHIEF ENGINEER DATE



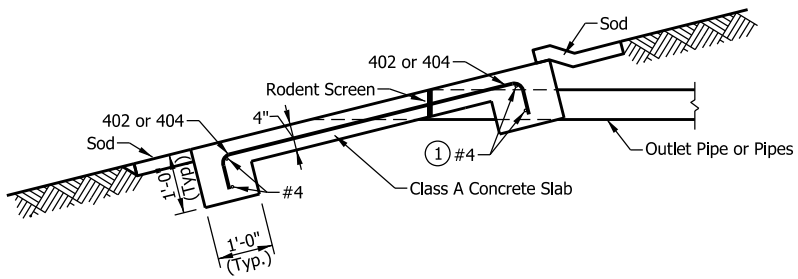
PLAN VIEW



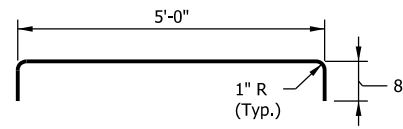
SECTION C-C

NOTE:

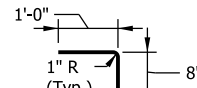
- ① The #4 transverse bars in the upslope lug may be field cut to accommodate the outlet pipe or pipes. The 404 bars in the upslope lug may be moved to accommodate the outlet pipe or pipes.



TYPICAL SECTION



402 X 6'-4"



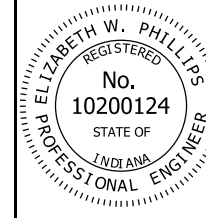
404 x 1'-8"

INDIANA DEPARTMENT OF TRANSPORTATION

OUTLET PROTECTOR, TYPE 2

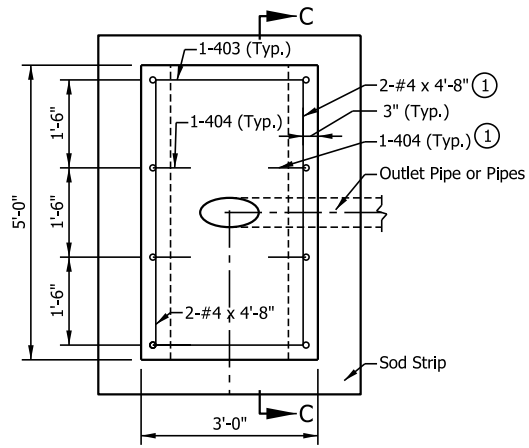
SEPTEMBER 2017

STANDARD DRAWING NO. E 718-UNDR-05

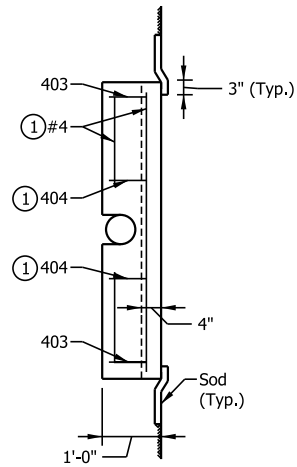


/s/ Elizabeth W. Phillips 08/26/16
DESIGN STANDARDS ENGINEER DATE

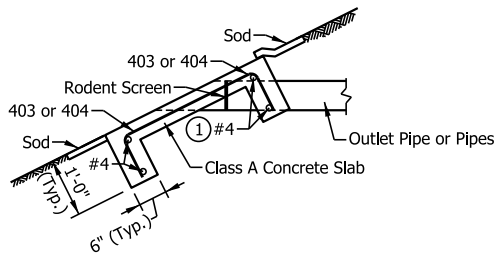
/s/ Mark A. Miller 09/19/16
CHIEF ENGINEER DATE



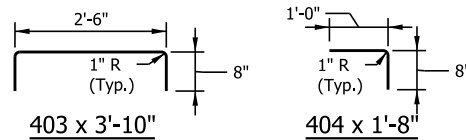
PLAN VIEW



SECTION C-C



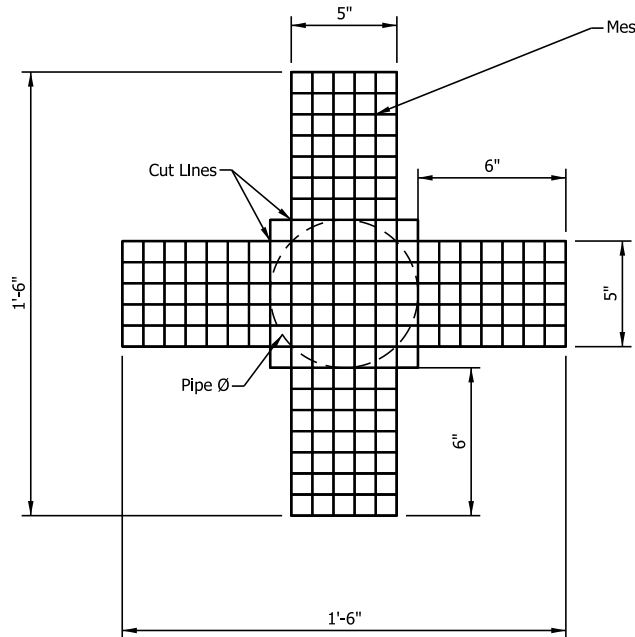
TYPICAL SECTION



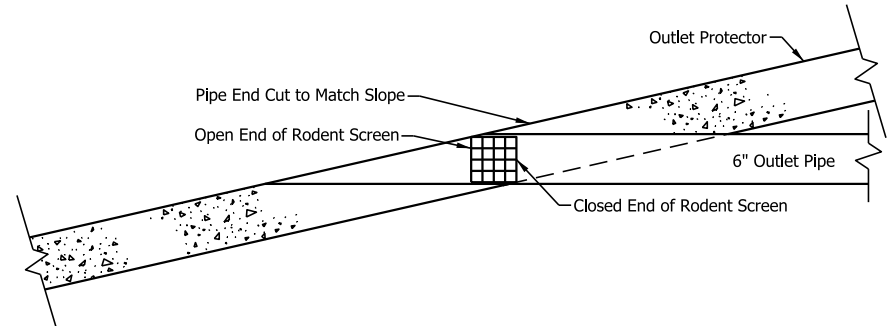
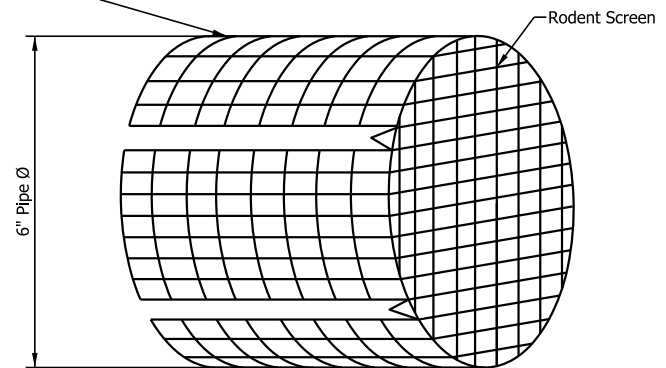
NOTE:

- ① The #4 transverse bars in the upslope lug may be field cut to accommodate the outlet pipe or pipes. The 404 bars in the upslope lug may be moved to accommodate the outlet pipe or pipes.

INDIANA DEPARTMENT OF TRANSPORTATION	
OUTLET PROTECTOR, TYPE 3	
SEPTEMBER 2017	
STANDARD DRAWING NO. E 718-UNDR-06	
	<i>/s/ Elizabeth W. Phillips</i> 08/26/16 <small>DESIGN STANDARDS ENGINEER DATE</small>
	<i>/s/ Mark A. Miller</i> 09/19/16 <small>CHIEF ENGINEER DATE</small>



Mesh Size = 3 Openings per 1"
Wire Ø = 0.072"



INDIANA DEPARTMENT OF TRANSPORTATION	
OUTLET PROTECTOR RODENT SCREEN	
SEPTEMBER 2017	
STANDARD DRAWING NO. E 718-UNDR-07	
	<i>/s/ Elizabeth W. Phillips</i> 08/26/16 DESIGN STANDARDS ENGINEER DATE
	<i>/s/ Mark A. Miller</i> 09/19/16 CHIEF ENGINEER DATE