

**ROADWAY STANDARD DRAWING FOR CONCRETE CATCH BASIN 12" THRU 54" PIPE**

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

GENERAL NOTES:  
USE CLASS "B" CONCRETE THROUGHOUT.  
PROVIDE ALL DITCH PARTS OVER 3'-0" IN DEPTH WITH STEPS 12" ON CENTER. USE STEPS WITH COMPL. WITH STD. DRAWING 840.02.  
OPTIONAL CONSTRUCTION - MONOLITHIC PUMP, 2" KEYWAY, OR 3/4" BAR DOMELS AT 12" CENTERS AS DIRECTED BY THE ENGINEER.  
USE FORMS FOR THE CONSTRUCTION OF THE BOTTOM SLAB.  
IF REINFORCED CONCRETE PIPE IS SET IN BOTTOM SLAB OR BOX, ADD TO SLAB AS SHOWN ON STD. NO. 840.02.  
USE TYPE "E", "F" AND "G" GRATES UNLESS OTHERWISE INDICATED.  
FOR 8" TO 12" IN HEIGHT OR LESS USE 8" WALLS AND BOTTOM SLAB - OVER 8" TO 12" IN HEIGHT USE 8" WALLS AND BOTTOM SLAB - ADJUST QUANTITIES ACCORDINGLY.  
CONSTRUCT WITH PIPE GROOVES MATCHING.  
CHAMFER ALL EXPOSED CORNERS 1".  
DRAWING NOT TO SCALE.

DETAIL SHOWING METHOD OF REBAR CONSTRUCTION

**ROADWAY STANDARD DRAWING FOR FRAME, GRATES, AND HOOD FOR USE ON STANDARD CATCH BASIN**

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

DETAIL SHOWING TYPES OF GRATES USE ACCORDING TO WATER FLOW

DETAIL SHOWING METHOD OF REBAR CONSTRUCTION

**ROADWAY STANDARD DRAWING FOR CONCRETE DROP INLET 12" THRU 30" PIPE**

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

GENERAL NOTES:  
USE CLASS "B" CONCRETE THROUGHOUT.  
PROVIDE A DEEP INLET OVER 2'-0" IN DEPTH WITH STEPS 12" ON CENTER. USE STEPS WITH COMPL. WITH STD. DRAWING 840.02.  
OPTIONAL CONSTRUCTION - MONOLITHIC PUMP, 2" KEYWAY, OR 3/4" BAR DOMELS AT 12" CENTERS AS DIRECTED BY THE ENGINEER.  
USE FORMS FOR THE CONSTRUCTION OF THE BOTTOM SLAB.  
IF REINFORCED CONCRETE PIPE IS SET IN BOTTOM SLAB OR BOX, ADD TO SLAB AS SHOWN ON STD. NO. 840.02.  
CONSTRUCT WITH PIPE GROOVES MATCHING.  
SEE STANDARD DRAWING 840.02 FOR ATTACHMENT OF FRAMES AND GRATES NOT SHOWN.  
INSTALL 8" REBAR AS DIRECTED BY THE ENGINEER.  
INSTALL STONE GRADERS, OR A MINIMUM OF 1" DEEP FOOT OF 40, 700 STONE IN FRONT OF EACH HOOD OR HOOP. AT EACH HOOD HOOP OR AS DIRECTED BY THE ENGINEER.  
CHAMFER ALL EXPOSED CORNERS 1".  
DRAWING NOT TO SCALE.

**ROADWAY STANDARD DRAWING FOR CONCRETE JUNCTION BOX (WITH OPTIONAL MANHOLE) 12" THRU 66" PIPE**

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

GENERAL NOTES:  
CHAMFER ALL EXPOSED CORNERS 1".  
USE CLASS "B" CONCRETE THROUGHOUT.  
OPTIONAL CONSTRUCTION - MONOLITHIC PUMP, 2" KEYWAY, OR 3/4" BAR DOMELS AT 12" CENTERS AS DIRECTED BY THE ENGINEER.  
USE FORMS TO CONSTRUCT THE BOTTOM SLAB.  
IF REINFORCED CONCRETE PIPE IS SET IN BASE SLAB OF BOX, ADD TO BASE AS SHOWN ON STANDARD NO. 840.02.  
PROVIDE ALL JUNCTION BOXES OVER 3'-0" IN DEPTH WITH STEPS 12" ON CENTER IN ACCORDANCE WITH STD. NO. 840.02.  
ADJUST THE STEPS, CONNECTIONS AND BRICK MASONRY GRADERS TO INCLUDE THE REDUCTION OF THE MANHOLE TO THE BOTTOM OF THE BOX. HEIGHT BRICK MASONRY, INCLUDING 1" CHAMFER ALL EXPOSED CORNERS 1".  
MAX. DEPTH OF THIS STRUCTURE FROM TOP OF BOX TO BOTTOM OF INLET SHALL BE 19 FEET.

DETAIL SHOWING METHOD OF REBAR CONSTRUCTION

PIPE SPAN	WIDTH	HEIGHT	CONCRETE (CY)	REBAR (LBS)	REBAR (SQ. FT.)	REBAR (LBS)	REBAR (SQ. FT.)	REBAR (LBS)	REBAR (SQ. FT.)
12"	12"	12"	0.187	0.187	0.187	22	0.750	0.218	0.284
18"	18"	18"	0.199	0.199	0.199	24	0.802	0.232	0.306
24"	24"	24"	0.227	0.227	0.227	30	1.065	0.252	0.328
30"	30"	30"	0.256	0.256	0.256	40	1.424	0.258	0.385
36"	36"	36"	0.375	0.375	0.375	51	1.880	0.282	0.427
42"	42"	42"	0.483	0.483	0.483	66	2.341	0.332	0.478
48"	48"	48"	0.589	0.589	0.589	77	2.873	0.359	0.520
54"	54"	54"	0.743	0.743	0.743	111	4.223	0.352	0.597
60"	60"	60"	0.865	0.865	0.865	139	5.290	0.357	0.651
66"	66"	66"	1.010	1.010	1.010	169	6.917	0.444	0.889

**ROADWAY STANDARD DRAWING FOR CONCRETE CATCH BASIN 12" THRU 54" PIPE**

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

GENERAL NOTES:  
USE CLASS "B" CONCRETE THROUGHOUT.  
PROVIDE ALL DITCH PARTS OVER 3'-0" IN DEPTH WITH STEPS 12" ON CENTER. USE STEPS WITH COMPL. WITH STD. DRAWING 840.02.  
OPTIONAL CONSTRUCTION - MONOLITHIC PUMP, 2" KEYWAY, OR 3/4" BAR DOMELS AT 12" CENTERS AS DIRECTED BY THE ENGINEER.  
USE FORMS FOR THE CONSTRUCTION OF THE BOTTOM SLAB.  
IF REINFORCED CONCRETE PIPE IS SET IN BOTTOM SLAB OR BOX, ADD TO SLAB AS SHOWN ON STD. NO. 840.02.  
CONSTRUCT WITH PIPE GROOVES MATCHING.  
CHAMFER ALL EXPOSED CORNERS 1".  
DRAWING NOT TO SCALE.

**ROADWAY STANDARD DRAWING FOR CONCRETE DROP INLET 12" THRU 30" PIPE**

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

GENERAL NOTES:  
USE CLASS "B" CONCRETE THROUGHOUT.  
PROVIDE ALL DITCH PARTS OVER 3'-0" IN DEPTH WITH STEPS 12" ON CENTER. USE STEPS WITH COMPL. WITH STD. DRAWING 840.02.  
OPTIONAL CONSTRUCTION - MONOLITHIC PUMP, 2" KEYWAY, OR 3/4" BAR DOMELS AT 12" CENTERS AS DIRECTED BY THE ENGINEER.  
USE FORMS FOR THE CONSTRUCTION OF THE BOTTOM SLAB.  
IF REINFORCED CONCRETE PIPE IS SET IN BOTTOM SLAB OR BOX, ADD TO SLAB AS SHOWN ON STD. NO. 840.02.  
CONSTRUCT WITH PIPE GROOVES MATCHING.  
SEE STANDARD DRAWING 840.02 FOR ATTACHMENT OF FRAMES AND GRATES NOT SHOWN.  
INSTALL 8" REBAR AS DIRECTED BY THE ENGINEER.  
INSTALL STONE GRADERS, OR A MINIMUM OF 1" DEEP FOOT OF 40, 700 STONE IN FRONT OF EACH HOOD OR HOOP. AT EACH HOOD HOOP OR AS DIRECTED BY THE ENGINEER.  
CHAMFER ALL EXPOSED CORNERS 1".  
DRAWING NOT TO SCALE.

**ROADWAY STANDARD DRAWING FOR CONCRETE JUNCTION BOX (WITH OPTIONAL MANHOLE) 12" THRU 66" PIPE**

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

NOTES:  
1. CLASS OR GRAN SIZE OF RIPRAP AND LENGTH, WIDTH AND DEPTH OF APRON TO BE DESIGNED BY ENGINEER.  
2. REFER TO THE CHARLOTTE MECKLENBURG STORM WATER DESIGN MANUAL FOR RIPRAP APRON DESIGN STANDARDS.  
3. RIPRAP SHOULD EXTEND TO BOTH SIDES OF THE APRON AND AROUND THE END OF THE PIPE OR CULVERT AT THE DISCHARGE OUTLET AT A MAXIMUM SLOPE OF 8:1 AND A HEIGHT NOT LESS THAN TWO TIMES THE PIPE DIAMETER OR CULVERT HEIGHT.  
4. THERE SHALL BE NO OVERFLOW FROM THE END OF THE APRON TO THE SURFACE OF THE RECEIVING CHANNEL. THE AREA TO BE PAVED OR REPAVED SHALL BE UNDERCUT SO THAT THE INVERT OF THE APRON SHALL BE AT THE SAME GRADE (PLUS) WITH THE SURFACE OF THE RECEIVING CHANNEL. THE APRON SHALL HAVE A CUTOFF OR TOE WALL AT THE DOWNSTREAM END.  
5. THE WIDTH OF THE END OF THE APRON SHALL BE EQUAL TO THE BOTTOM WIDTH OF THE RECEIVING CHANNEL. MAXIMUM TAPER TO RECEIVING CHANNEL 5:1.  
6. ALL SUBGRADE FOR STRUCTURE TO BE COMPACTED TO 95% OR GREATER.  
7. THE PLACING OF FILL, EITHER LOOSE OR COMPACTED IN THE RECEIVING CHANNEL SHALL NOT BE ALLOWED.  
8. NO BENDS OR CURVES IN THE HORIZONTAL ALIGNMENT OF THE APRON WILL BE PERMITTED.  
9. FILTER FABRIC SHALL BE INSTALLED ON COMPACTED SUBGRADE PRIOR TO PLACEMENT OF RIP RAP.  
10. ANY DISTURBED AREA FROM END OF APRON TO RECEIVING CHANNEL MUST BE STABILIZED.

USE USDA MONOGRAPH FROM NC SEDIMENT AND EROSION CONTROL MANUAL OR CHARLOTTE MECKLENBURG STORM WATER DESIGN MANUAL FOR DESIGN DATA.

OUTLET	L <sub>1</sub>	W <sub>1</sub>	W <sub>2</sub>	T	H
PES-1	10'	1.5'	4.5'	0.83'	1'
DRIVEWAY OUTLET PIPE	10'	1.5'	4.5'	0.83'	1'

**ROADWAY STANDARD DRAWING FOR FRAME, GRATES, AND HOOD FOR USE ON STANDARD CATCH BASIN**

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

NOTE: USE TYPE "E", "F" AND "G" GRATE UNLESS OTHERWISE NOTED.

**ROADWAY STANDARD DRAWING FOR CONCRETE DROP INLET 12" THRU 30" PIPE**

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

GENERAL NOTES:  
USE CLASS "B" CONCRETE THROUGHOUT.  
PROVIDE ALL DITCH PARTS OVER 3'-0" IN DEPTH WITH STEPS 12" ON CENTER. USE STEPS WITH COMPL. WITH STD. DRAWING 840.02.  
OPTIONAL CONSTRUCTION - MONOLITHIC PUMP, 2" KEYWAY, OR 3/4" BAR DOMELS AT 12" CENTERS AS DIRECTED BY THE ENGINEER.  
USE FORMS FOR THE CONSTRUCTION OF THE BOTTOM SLAB.  
IF REINFORCED CONCRETE PIPE IS SET IN BOTTOM SLAB OR BOX, ADD TO SLAB AS SHOWN ON STD. NO. 840.02.  
CONSTRUCT WITH PIPE GROOVES MATCHING.  
SEE STANDARD DRAWING 840.02 FOR ATTACHMENT OF FRAMES AND GRATES NOT SHOWN.  
INSTALL 8" REBAR AS DIRECTED BY THE ENGINEER.  
INSTALL STONE GRADERS, OR A MINIMUM OF 1" DEEP FOOT OF 40, 700 STONE IN FRONT OF EACH HOOD OR HOOP. AT EACH HOOD HOOP OR AS DIRECTED BY THE ENGINEER.  
CHAMFER ALL EXPOSED CORNERS 1".  
DRAWING NOT TO SCALE.

**ROADWAY STANDARD DRAWING FOR CONCRETE JUNCTION BOX (WITH OPTIONAL MANHOLE) 12" THRU 66" PIPE**

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

GENERAL NOTES:  
CHAMFER ALL EXPOSED CORNERS 1".  
USE CLASS "B" CONCRETE THROUGHOUT.  
OPTIONAL CONSTRUCTION - MONOLITHIC PUMP, 2" KEYWAY, OR 3/4" BAR DOMELS AT 12" CENTERS AS DIRECTED BY THE ENGINEER.  
USE FORMS TO CONSTRUCT THE BOTTOM SLAB.  
IF REINFORCED CONCRETE PIPE IS SET IN BASE SLAB OF BOX, ADD TO BASE AS SHOWN ON STANDARD NO. 840.02.  
PROVIDE ALL JUNCTION BOXES OVER 3'-0" IN DEPTH WITH STEPS 12" ON CENTER IN ACCORDANCE WITH STD. NO. 840.02.  
ADJUST THE STEPS, CONNECTIONS AND BRICK MASONRY GRADERS TO INCLUDE THE REDUCTION OF THE MANHOLE TO THE BOTTOM OF THE BOX. HEIGHT BRICK MASONRY, INCLUDING 1" CHAMFER ALL EXPOSED CORNERS 1".  
MAX. DEPTH OF THIS STRUCTURE FROM TOP OF BOX TO BOTTOM OF INLET SHALL BE 19 FEET.

**ROADWAY STANDARD DRAWING FOR CONCRETE CATCH BASIN 12" THRU 54" PIPE**

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

NO.	DATE	REVISION
1		
2		
3		
4		
5		

**ROADWAY STANDARD DRAWING FOR FRAME, GRATES, AND HOOD FOR USE ON STANDARD CATCH BASIN**

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

NO.	DATE	REVISION
1		
2		
3		
4		
5		

**ROADWAY STANDARD DRAWING FOR DROP INLET FRAME AND GRATES FOR USE WITH STD. DWG. S 840.14 AND 840.15**

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

NO.	DATE	REVISION
1		
2		
3		
4		
5		

**ROADWAY STANDARD DRAWING FOR CONCRETE JUNCTION BOX (WITH OPTIONAL MANHOLE) 12" THRU 66" PIPE**

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

NO.	DATE	REVISION
1		
2		
3		
4		
5		

**STORM DRAINAGE DETAILS**

FILE NUMBER: 6191-01  
DATE: 07/24/19  
C3-1

Know what's below. Call before you dig.