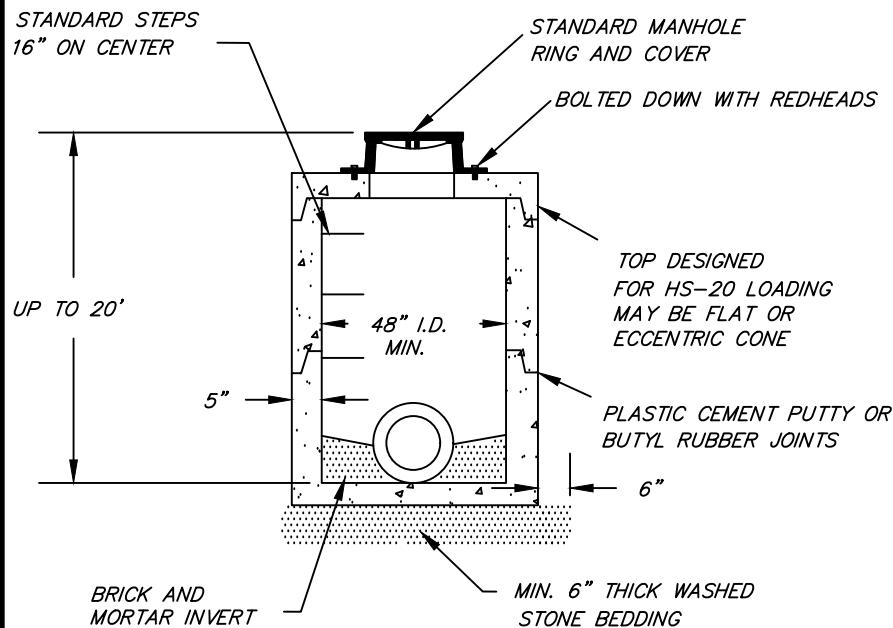
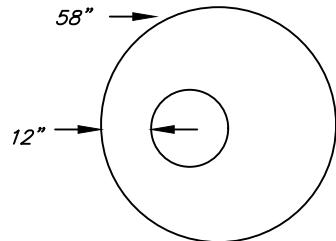


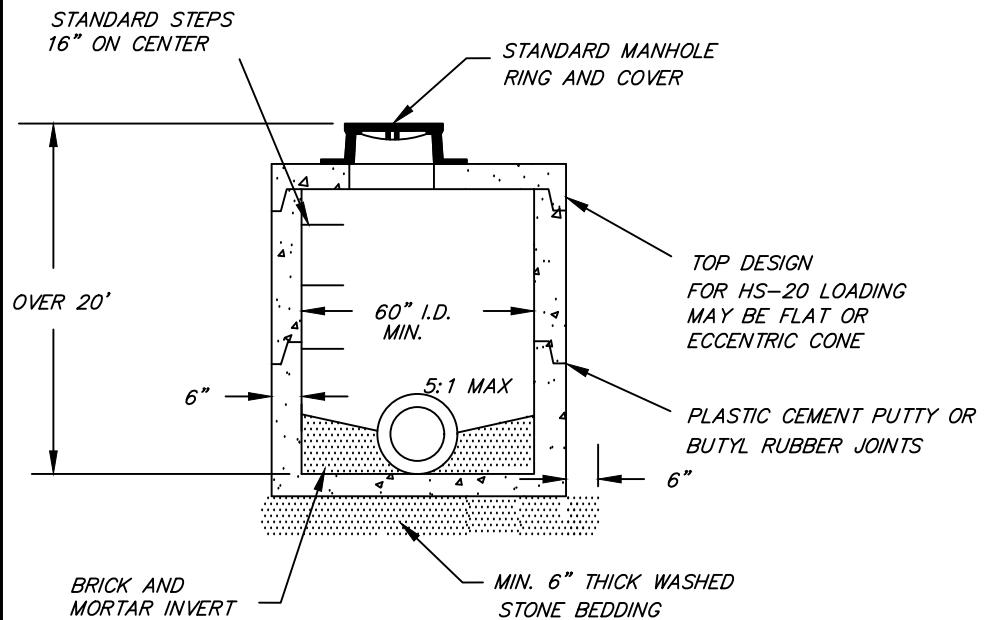
**STANDARD TYPE**  
(UP TO 20 FEET IN DEPTH)



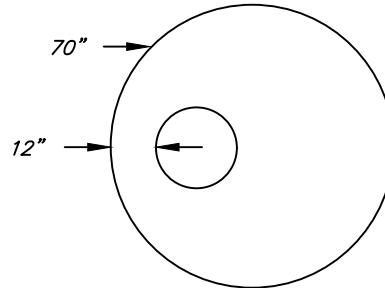
**FLAT TOP DETAIL**



**DEEP TYPE**  
(OVER 20 FEET IN DEPTH)



**FLAT TOP DETAIL**



DRAWING NOT TO SCALE

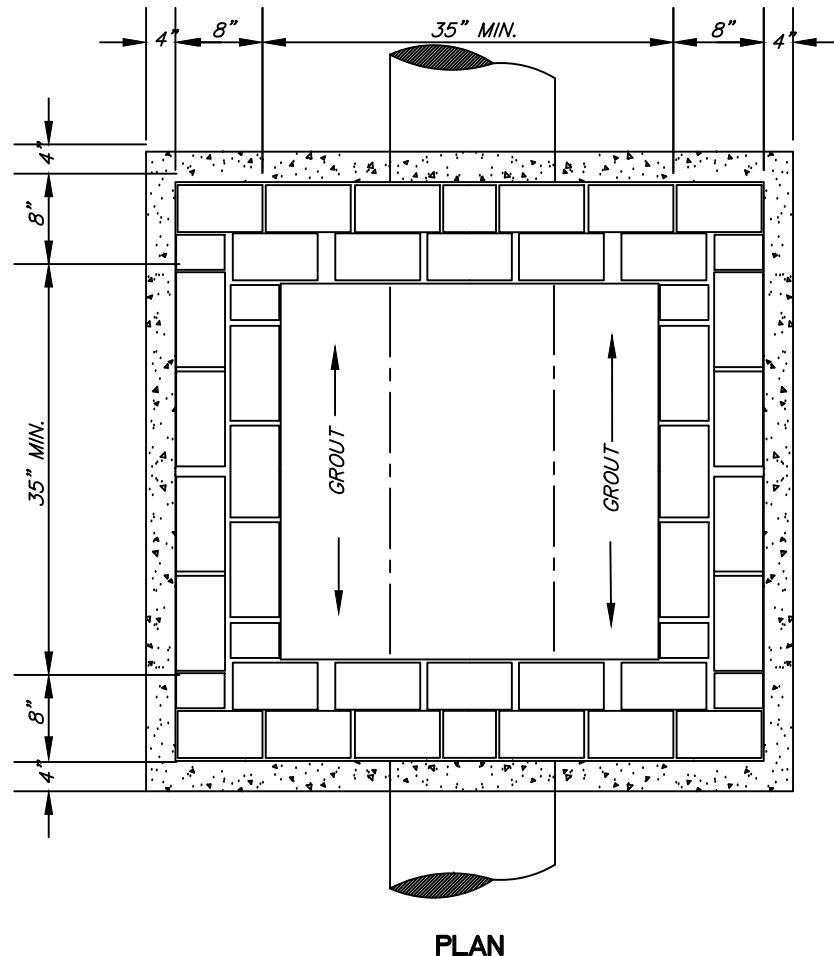
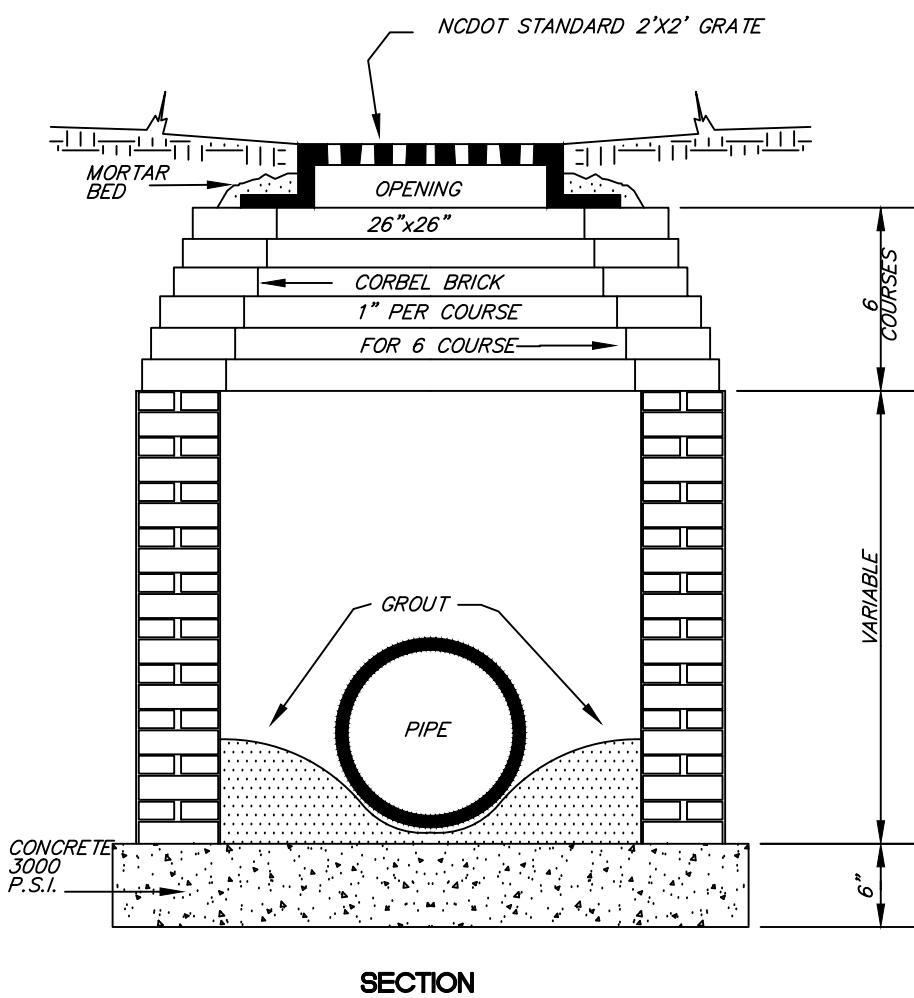
PRECAST CONCRETE MANHOLE STORM DRAINAGE JUNCTION BOX

STANDARD DETAIL NUMBER: HS801

DATE    REVISIONS

7/24/09

TOWN OF HOLLY SPRINGS ENGINEERING DEPARTMENT



**NOTES:**

1. EITHER SOLID BRICK, SOLID BLOCK OR PRECAST CONCRETE MAY BE USED.
2. FOR 24" R.C.P. AND LARGER USE PIPE DIA. PLUS 12" FOR MINIMUM INSIDE DIMENSION.
3. GRATED INLETS SHALL NOT BE USED WITHIN TRAVEL AREAS WITHOUT APPROVAL OF DIRECTOR OF ENGINEERING.
4. STANDARD STEPS REQUIRED @ 16" O.C. WHERE DEPTH EXCEEDS 3'.

DRAWING NOT TO SCALE

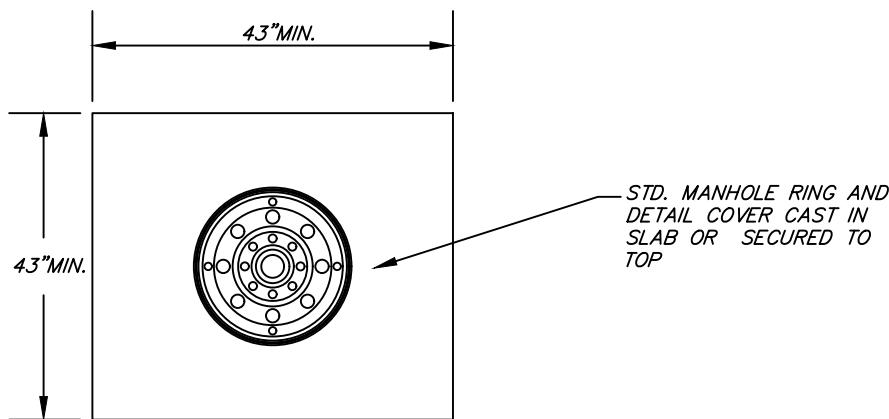
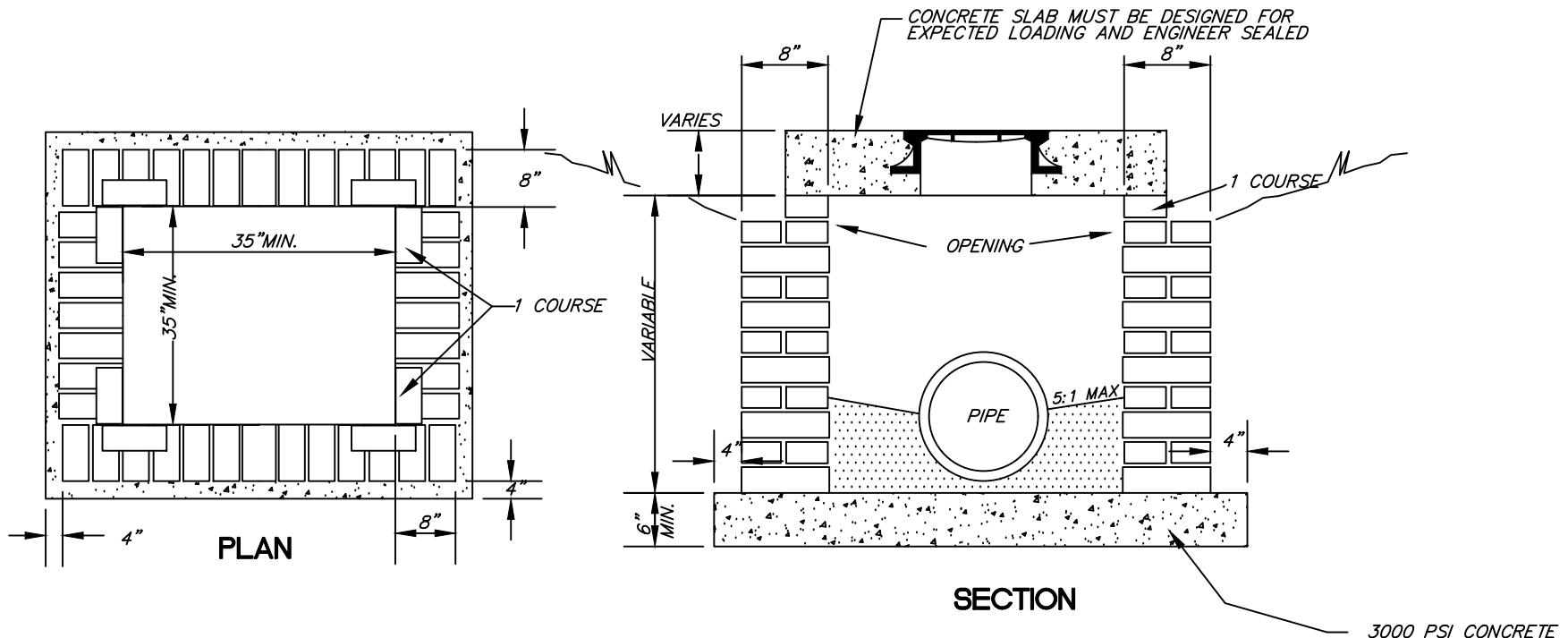
**STANDARD YARD INLET WITH GRATE AND FRAME**

TOWN OF HOLLY SPRINGS ENGINEERING DEPARTMENT

STANDARD DETAIL NUMBER: HS802

DATE    REVISIONS

7/24/09



CONCRETE SLAB

NOTES:

1. EITHER SOLID BRICK, SOLID BLOCK, OR PRECAST CONCRETE MAY BE USED.
2. STANDARD STEPS REQUIRED @ 16" O.C. WHERE DEPTH EXCEEDS 3'.
3. USE MIN. 3000 P.S.I. CONC. MIX.
4. INSIDE DIMENSION FOR 24" PIPE AND GREATER USE PIPE DIA. PLUS 12".

DRAWING NOT TO SCALE

**STANDARD YARD INLET WITH CONCRETE SLAB**

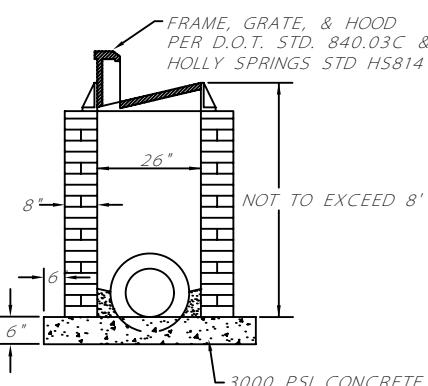
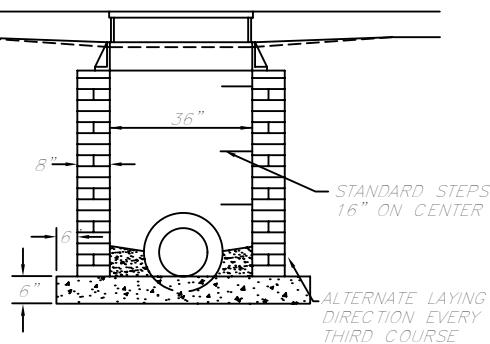
TOWN OF HOLLY SPRINGS ENGINEERING DEPARTMENT

STANDARD DETAIL NUMBER: HS803

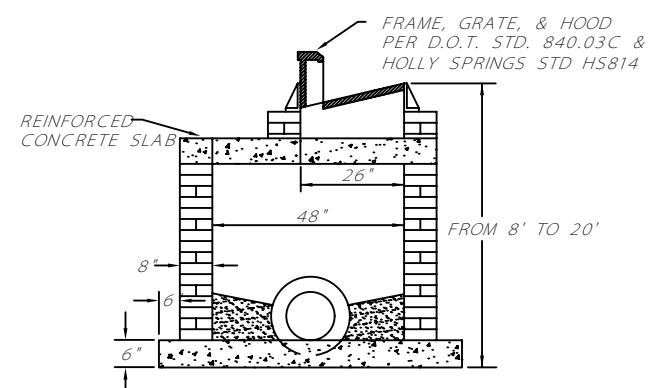
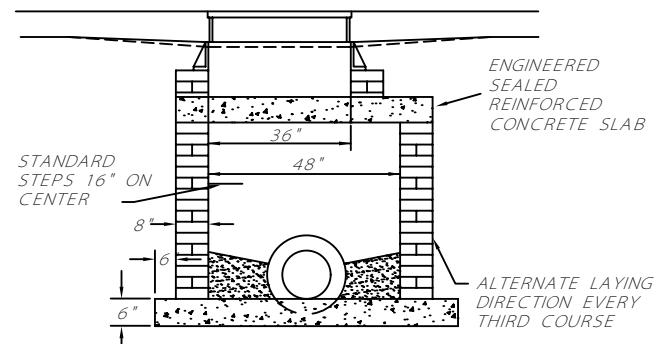
DATE REVISIONS

7/24/09

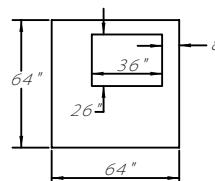
**SHALLOW TYPE**  
(5 FEET OR LESS IN DEPTH)



**INTERMEDIATE TYPE (4'X4')**  
(5 FEET TO 20 FEET IN DEPTH)



**SLAB DETAIL**

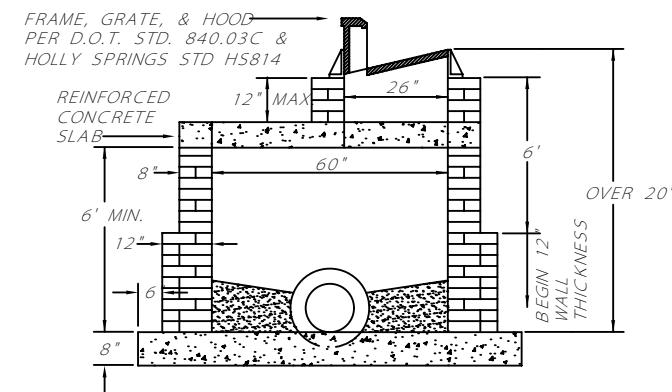
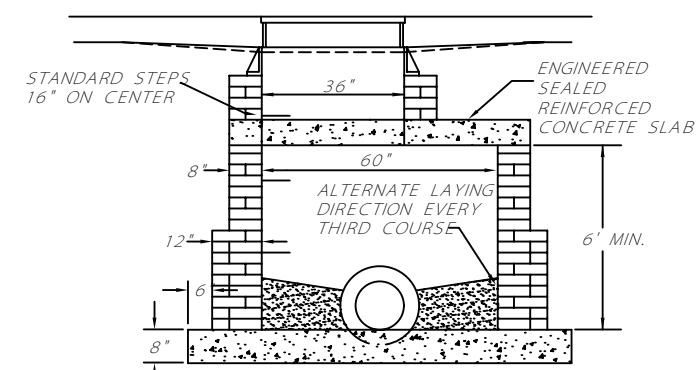


**NOTES:**

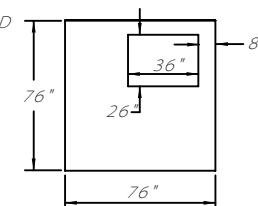
OVER 8' IN DEPTH, 12" WALL THICKNESS TO 6' FROM TOP OF WALL AND 8" BOTTOM SLAB SHALL BE USED.

SLAB THICKNESS AND REINFORCEMENT FOR SOIL AND TRAFFIC LOADING BY AN ENGINEER

**DEEP TYPE (5'X5')**  
(OVER 20 FEET IN DEPTH)



**SLAB DETAIL**



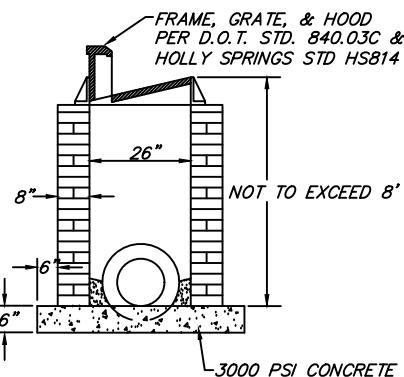
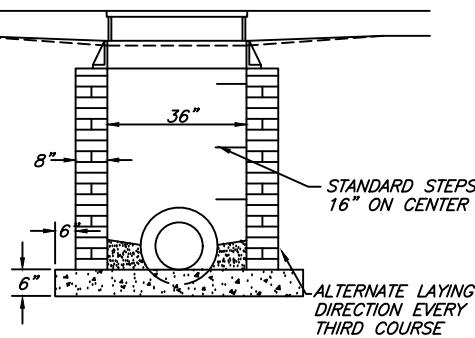
SLAB THICKNESS AND REINFORCEMENT FOR SOIL AND TRAFFIC LOADING BY AN ENGINEER

**CONCRETE BLOCK OR BRICK CATCH BASIN**

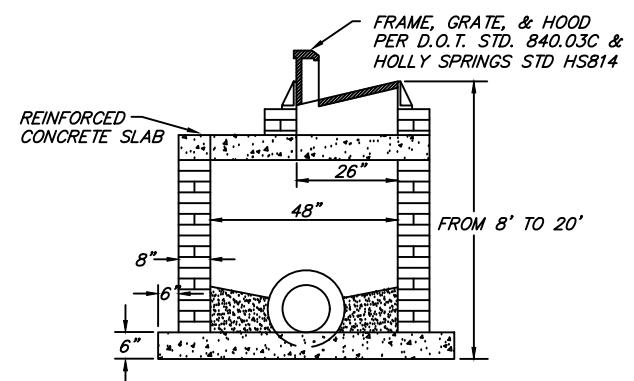
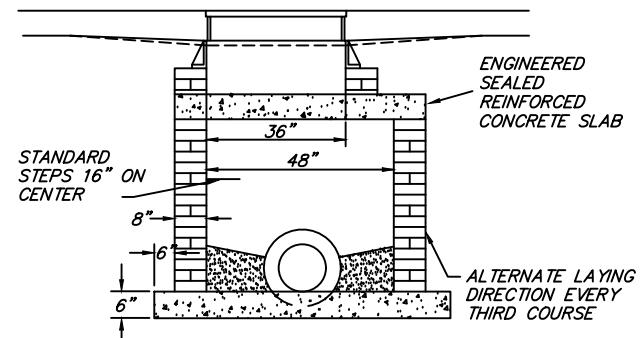
TOWN OF HOLLY SPRINGS ENGINEERING DEPARTMENT

STANDARD DETAIL NUMBER HS804  
DATE 7/24/09 REVISIONS

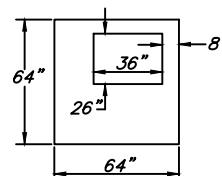
**SHALLOW TYPE**  
(5 FEET OR LESS IN DEPTH)



**INTERMEDIATE TYPE (4'X4')**  
(5 FEET TO 20 FEET IN DEPTH)



**SLAB DETAIL**

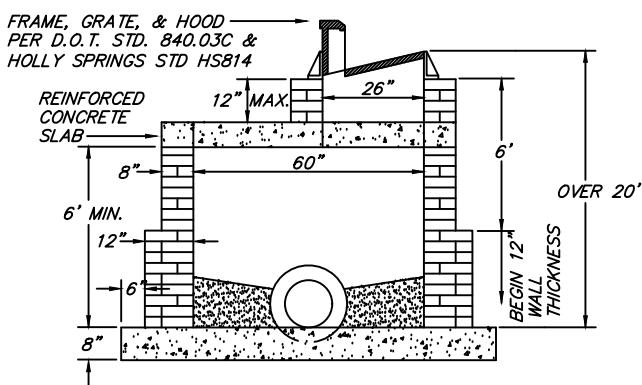
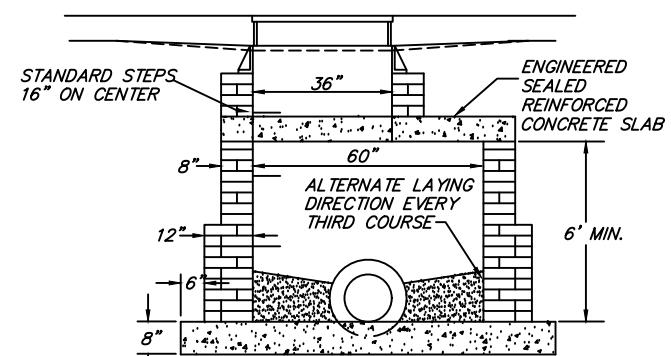


SLAB THICKNESS AND  
REINFORCEMENT FOR  
SOIL AND TRAFFIC  
LOADING BY AN  
ENGINEER

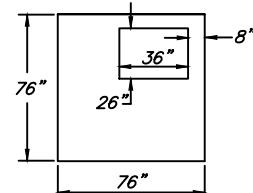
**NOTES:**

OVER 8' IN DEPTH, 12" WALL THICKNESS TO 6' FROM TOP  
OF WALL AND 8" BOTTOM SLAB SHALL BE USED.

**DEEP TYPE (5'X5')**  
(OVER 20 FEET IN DEPTH)



**SLAB DETAIL**



SLAB THICKNESS AND  
REINFORCEMENT FOR  
SOIL AND TRAFFIC  
LOADING BY AN  
ENGINEER

DRAWING NOT TO SCALE

**CONCRETE BLOCK OR BRICK CATCH BASIN**

TOWN OF HOLLY SPRINGS ENGINEERING DEPARTMENT

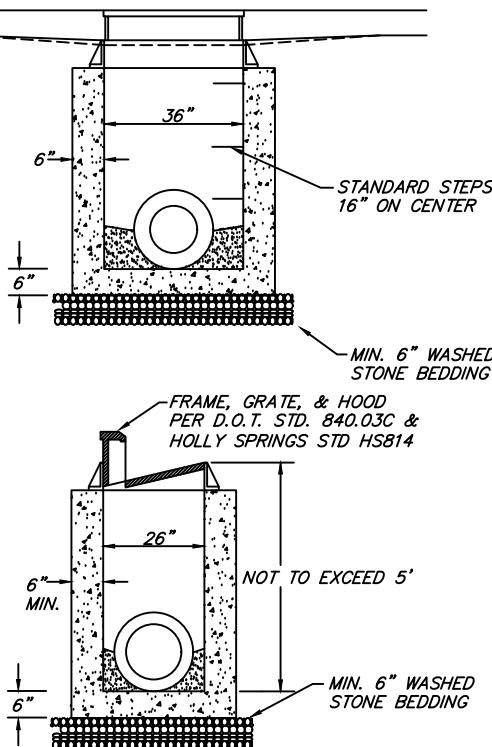
STANDARD DETAIL NUMBER: HS804

DATE      REVISIONS

7/24/09

### SHALLOW TYPE

(5 FEET OR LESS IN DEPTH)

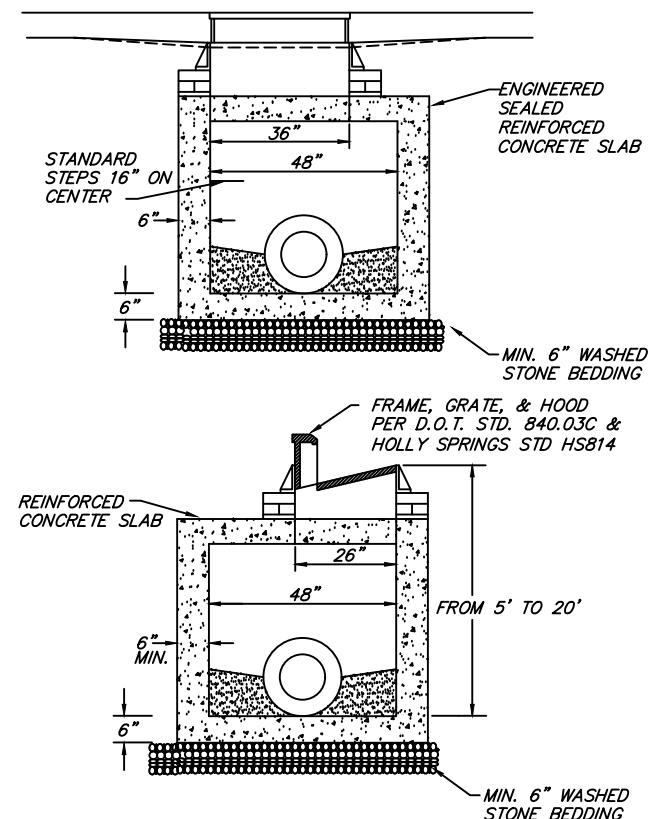


#### NOTES:

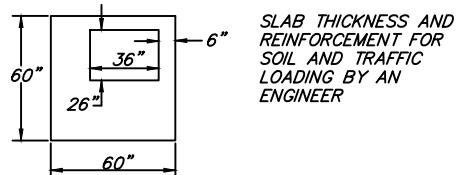
1. CONCRETE SHALL BE 4000 PSI MIN. FOR ALL PRECAST CONCRETE CATCH BASINS.
2. PRECAST CONCRETE STRUCTURES MAY ONLY BE INSTALLED TO DEPTHS CERTIFIED AS ACCEPTABLE BY THE MANUFACTURER.
3. NO WAFFLE BOXES ALLOWED.

### INTERMEDIATE TYPE (4'X4')

(5 FEET TO 20 FEET IN DEPTH)



### SLAB DETAIL



SLAB THICKNESS AND  
REINFORCEMENT FOR  
SOIL AND TRAFFIC  
LOADING BY AN  
ENGINEER

## PRECAST CONCRETE CATCH BASINS

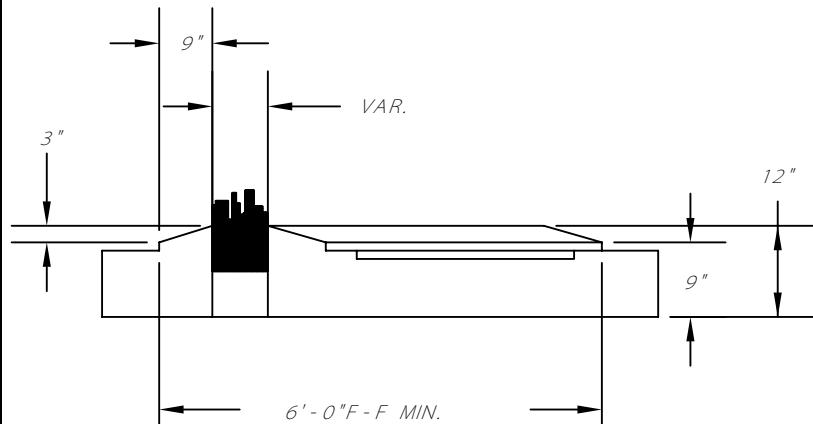
TOWN OF HOLLY SPRINGS ENGINEERING DEPARTMENT

STANDARD DETAIL NUMBER: HS805

DATE      REVISIONS

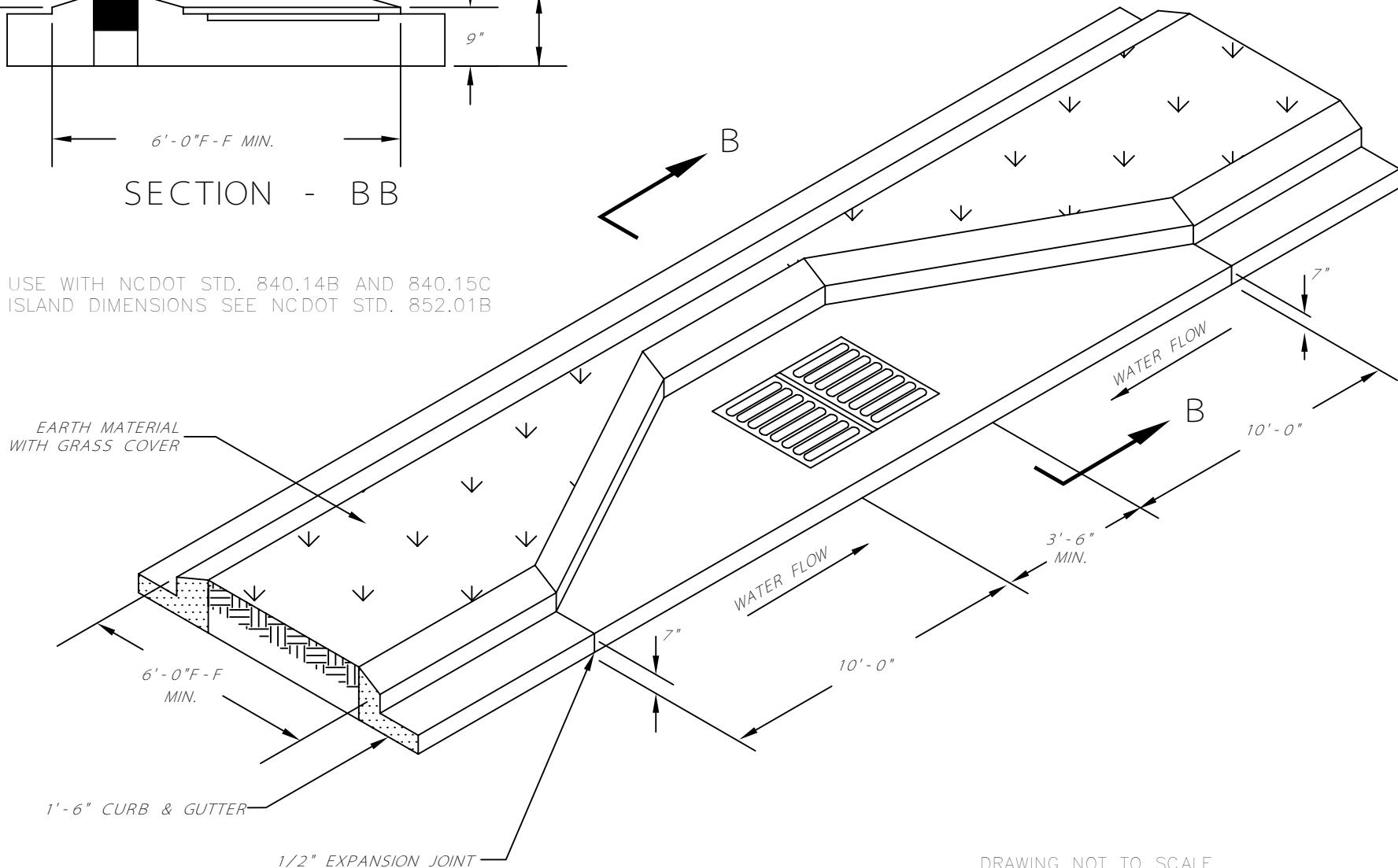
7/24/09

DRAWING NOT TO SCALE



SECTION - B B

FOR USE WITH NCDOT STD. 840.14B AND 840.15C  
FOR ISLAND DIMENSIONS SEE NCDOT STD. 852.01B



DRAWING NOT TO SCALE

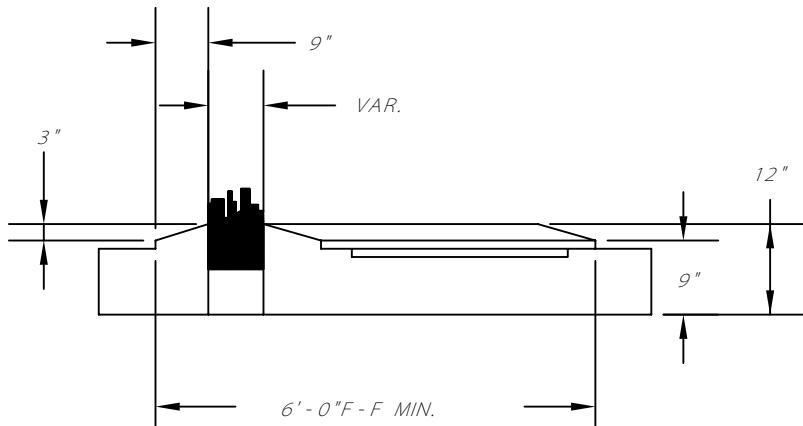
STANDARD MEDIAN CURB INLET  
(FLOW FROM BOTH DIRECTIONS)

TOWN OF HOLLY SPRINGS ENGINEERING DEPARTMENT

STANDARD DETAIL NUMBER HS806

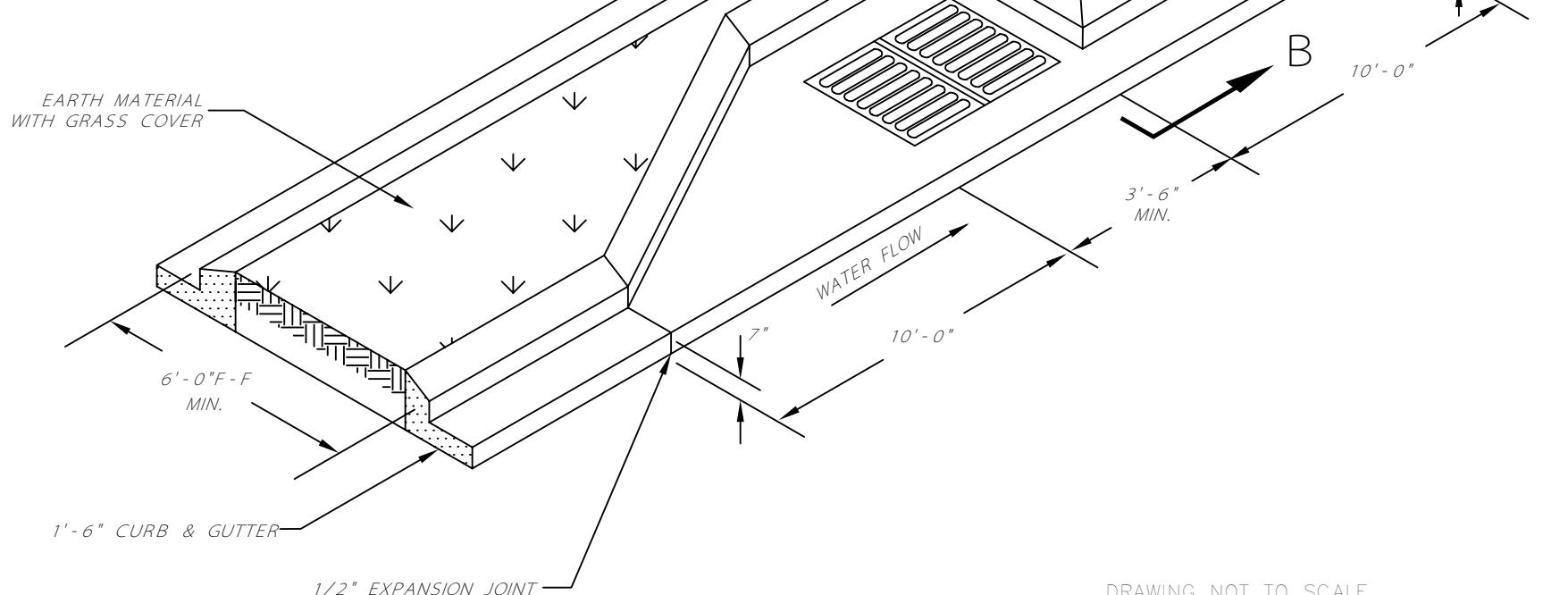
DATE 7/24/09

REVISIONS



SECTION - B B

FOR USE WITH NCDOT STD. 840.14B AND 840.15C  
FOR ISLAND DIMENSIONS SEE NCDOT STD. 852.01B



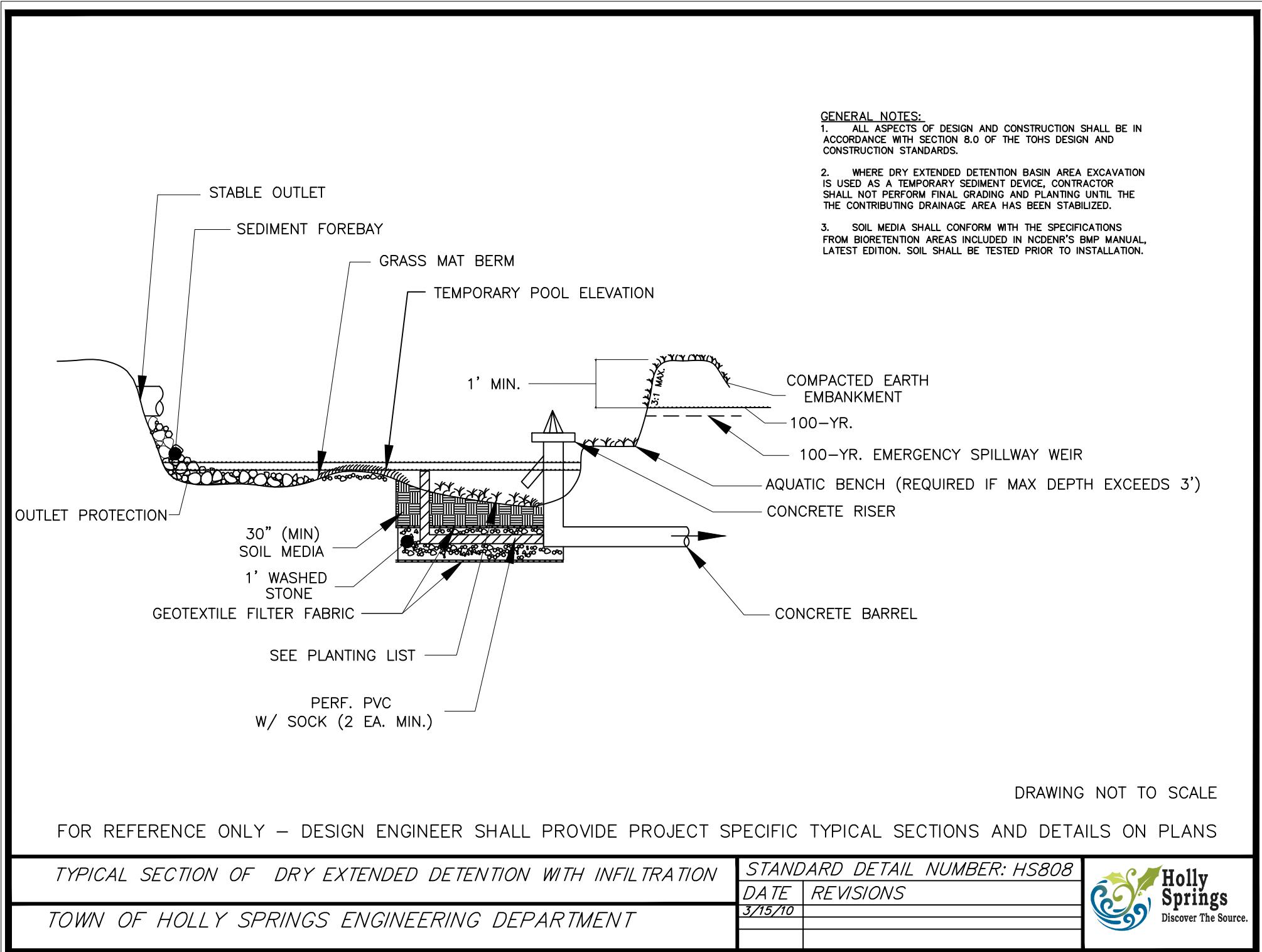
DRAWING NOT TO SCALE

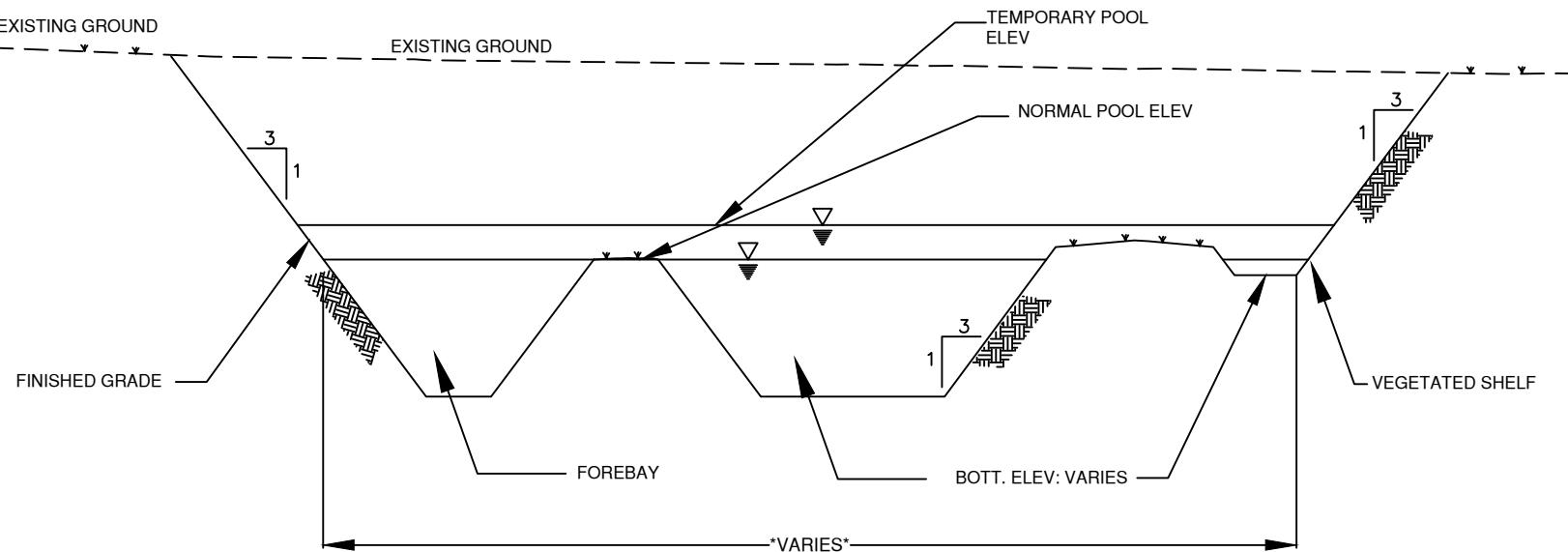
## STANDARD MEDIAN CURB INLET

TOWN OF HOLLY SPRINGS ENGINEERING DEPARTMENT

STANDARD DETAIL NUMBER HS807

DATE 7/24/09 REVISIONS





GENERAL NOTES:

1. ALL ASPECTS OF DESIGN AND CONSTRUCTION SHALL BE IN ACCORDANCE WITH SECTION 8.0 OF THE TOHS DESIGN AND CONSTRUCTION STANDARDS.
2. DESIGN ENGINEER SHALL PROVIDE DETAILED SECTION THROUGH THE OUTLET STRUCTURE(S).
3. WHERE WETLAND AREA EXCAVATION IS USED AS A TEMPORARY SEDIMENT DEVICE, CONTRACTOR SHALL NOT PERFORM FINAL GRADING AND INSTALL WETLAND PLANTING UNTIL THE CONTRIBUTING DRAINAGE AREA HAS BEEN STABILIZED.
4. PRETREATMENT AND RISER STRUCTURE SYSTEMS NOT SHOWN. DESIGN ENGINEER SHALL DETAIL THE SELECTED PRETREATMENT SYSTEM AND PROVIDE A DETAILED SECTION THROUGH THE OUTLET STRUCTURE AS APPROPRIATE.
5. A DETAILED WETLAND PLANTING PLAN IS REQUIRED AND IS NOT SHOWN.
6. APPROPRIATE DISTRIBUTION OF THE DEEP POOL, SHALLOW WATER, SHALLOW LAND, AND UPLAND DEPTH REGIONS IS CRITICAL TO PROPER DESIGN & PERFORMANCE. REFER TO NCDENR BMP MANUAL, LATEST EDITION FOR MORE DETAIL.
7. VEGETATIVE SHELF IS REQUIRED TO BE 50% SUBMERGED AT NORMAL POOL ELEVATION.
8. CLAY LINER IS REQUIRED IN DEEP POOLS.
9. MINIMUM OF 4" OF TOPSOIL IS REQUIRED IN ALL VEGETATED AREAS.

DRAWING NOT TO SCALE

FOR REFERENCE ONLY – DESIGN ENGINEER SHALL PROVIDE PROJECT SPECIFIC TYPICAL SECTIONS AND DETAILS ON PLANS

TYPICAL WETLAND SECTION

STANDARD DETAIL NUMBER: HS809

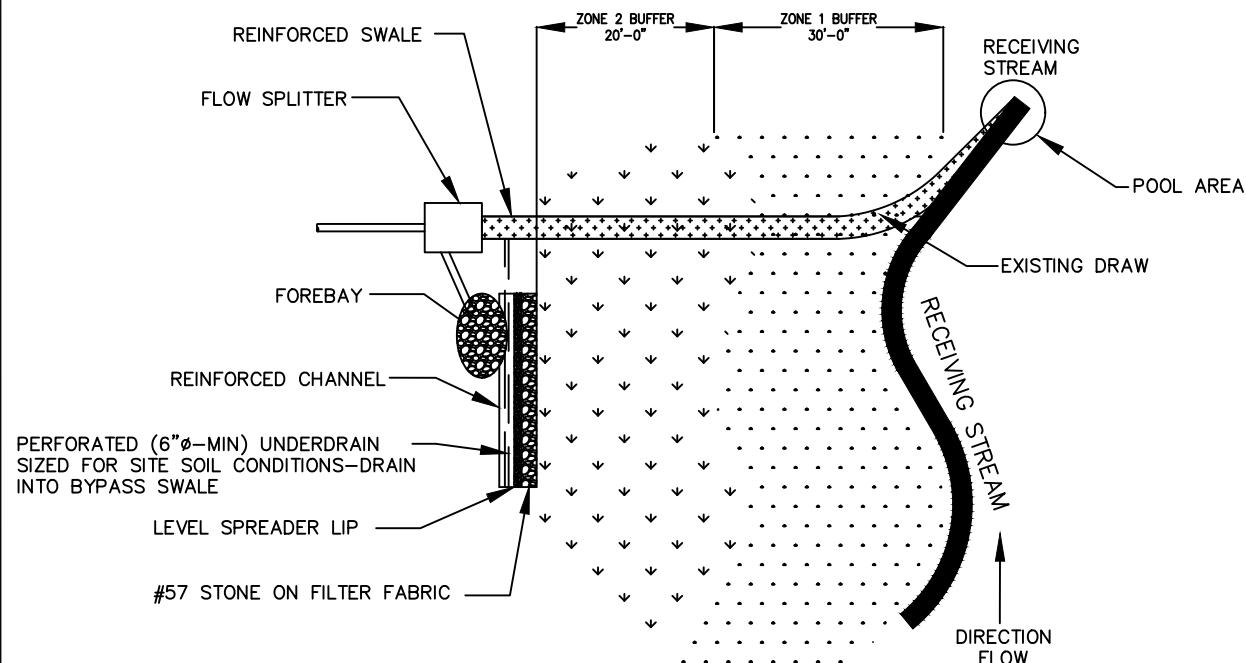
DATE

REVISIONS

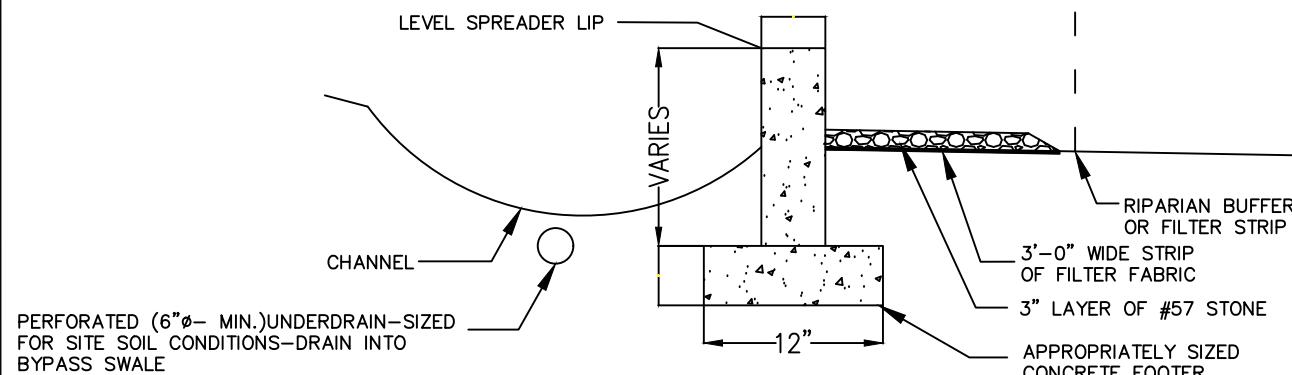
3/13/19

TOWN OF HOLLY SPRINGS ENGINEERING DEPARTMENT





\* NOTE : BUFFER DISTURBANCES SHOWN REQUIRE A PERMIT FROM NCDENR WHEN IN THE NEUSE RIVER BASIN



DRAWING NOT TO SCALE

FOR REFERENCE ONLY – DESIGN ENGINEER SHALL PROVIDE PROJECT SPECIFIC TYPICAL SECTIONS AND DETAILS ON PLANS

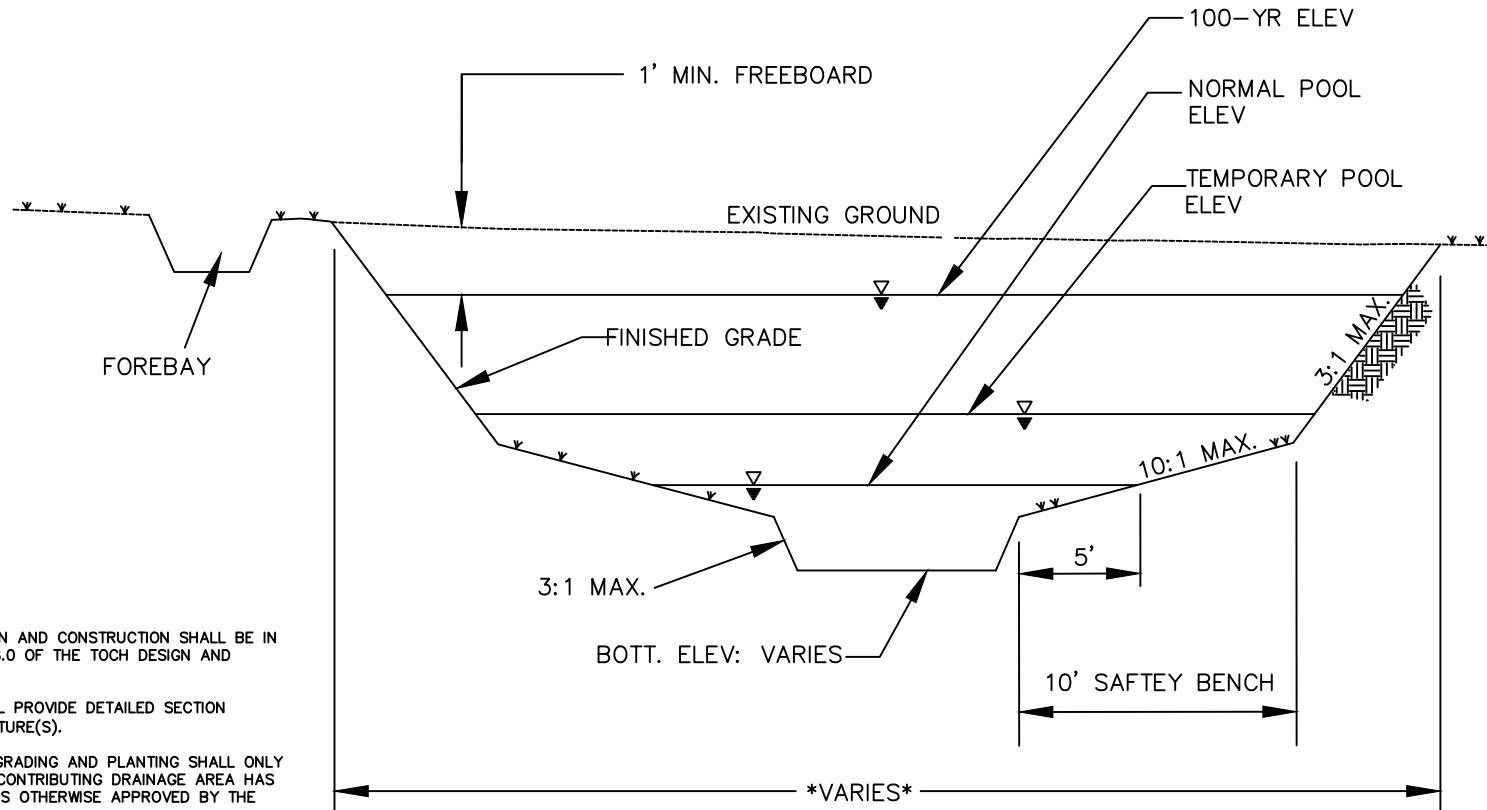
### TYPICAL LEVEL SPREADER

TOWN OF HOLLY SPRINGS ENGINEERING DEPARTMENT

STANDARD DETAIL NUMBER: HS810

DATE REVISIONS

8/13/10



DRAWING NOT TO SCALE

FOR REFERENCE ONLY – DESIGN ENGINEER SHALL PROVIDE PROJECT SPECIFIC TYPICAL SECTIONS AND DETAILS ON PLANS

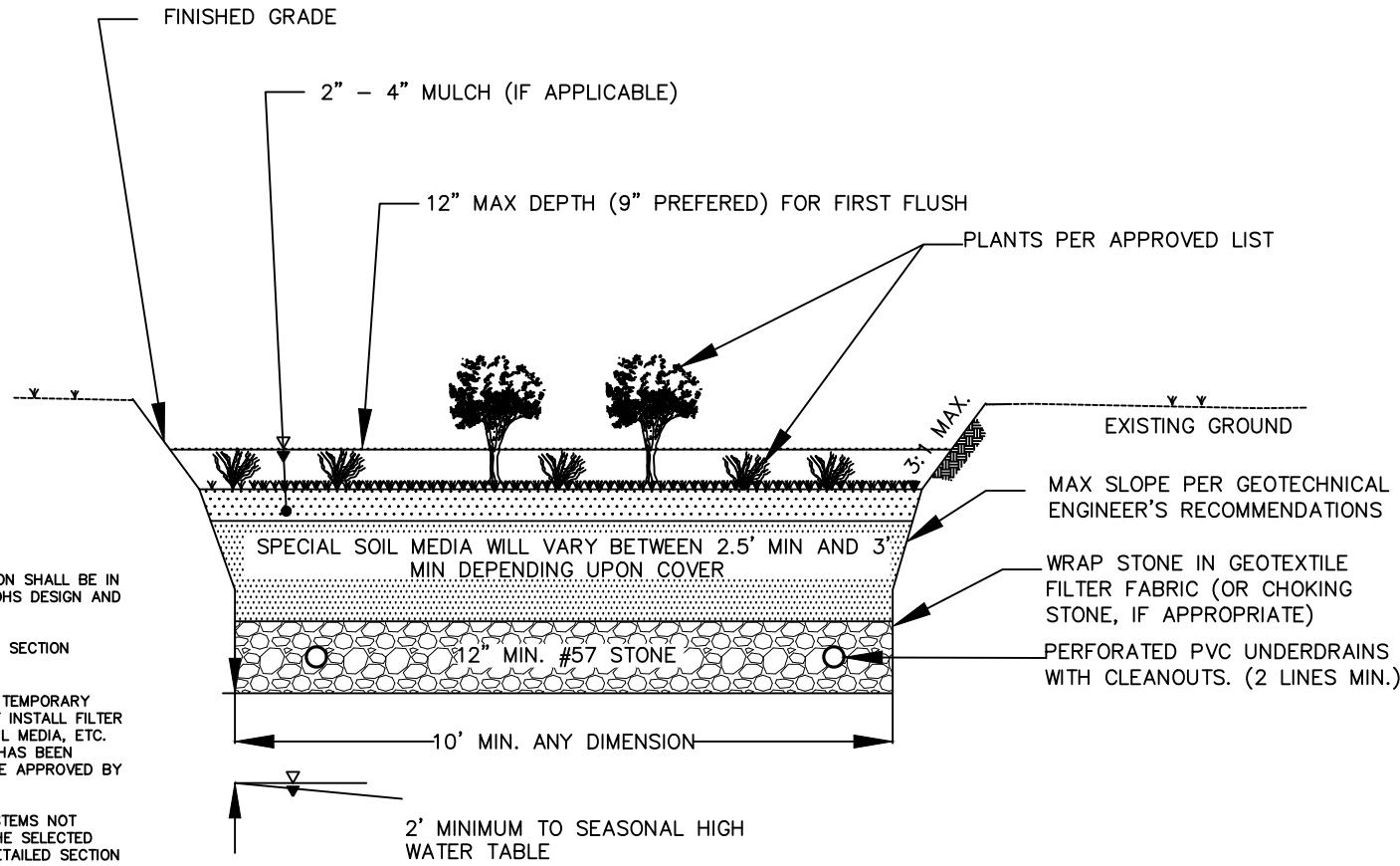
*TYPICAL WET DETENTION BASIN SECTION*

STANDARD DETAIL NUMBER: HS811

DATE      REVISIONS

7/24/09

TOWN OF HOLLY SPRINGS ENGINEERING DEPARTMENT



DRAWING NOT TO SCALE

FOR REFERENCE ONLY – DESIGN ENGINEER SHALL PROVIDE PROJECT SPECIFIC TYPICAL SECTIONS AND DETAILS ON PLANS

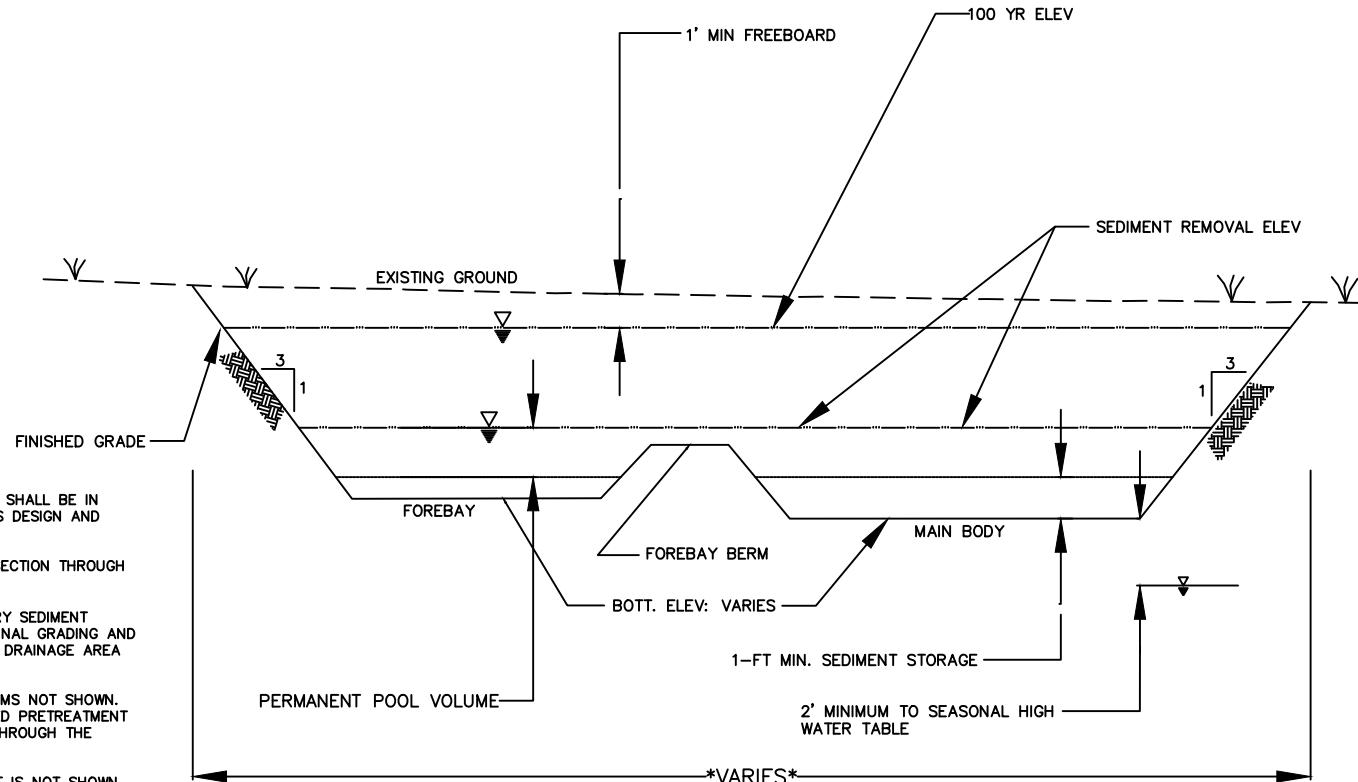
*TYPICAL BIORETENTION SECTION*

TOWN OF HOLLY SPRINGS ENGINEERING DEPARTMENT

STANDARD DETAIL NUMBER: HS812

DATE      REVISIONS

7/24/09



**GENERAL NOTES:**

1. ALL ASPECTS OF DESIGN AND CONSTRUCTION SHALL BE IN ACCORDANCE WITH SECTION 8.0 OF THE TOHS DESIGN AND CONSTRUCTION STANDARDS.
2. DESIGN ENGINEER SHALL PROVIDE DETAILED SECTION THROUGH THE OUTLET STRUCTURE(S).
3. WHERE EXCAVATION IS USED AS A TEMPORARY SEDIMENT DEVICE, CONTRACTOR SHALL NOT PERFORM FINAL GRADING AND INSTALL PLANTINGS UNTIL THE CONTRIBUTING DRAINAGE AREA HAS BEEN STABILIZED.
4. PRETREATMENT AND RISER STRUCTURE SYSTEMS NOT SHOWN. DESIGN ENGINEER SHALL DETAIL THE SELECTED PRETREATMENT SYSTEM AND PROVIDE A DETAILED SECTION THROUGH THE OUTLET STRUCTURE AS APPROPRIATE.
5. A DETAILED PLANTING PLAN IS REQUIRED BUT IS NOT SHOWN.
6. MAXIMUM DEPTH SHALL BE 10'.
7. MIN. LENGTH TO WIDTH RATIO SHALL BE 1.5:1
8. SEDIMENT DEPTH INDICATOR MUST BE PROVIDED IN BOTH THE FOREBAY AND MAINBODY.
9. FOREBAY REQUIRED WHEN FIRST FLUSH VOLUME EXCEEDS 10 ACRE INCHES.
10. THIS BMP TYPICALLY INCLUDES A SMALL MICROPOLY NEAR THE OUTLET STRUCTURE.

DRAWING NOT TO SCALE

FOR REFERENCE ONLY – DESIGN ENGINEER SHALL PROVIDE PROJECT SPECIFIC TYPICAL SECTIONS AND DETAILS ON PLANS

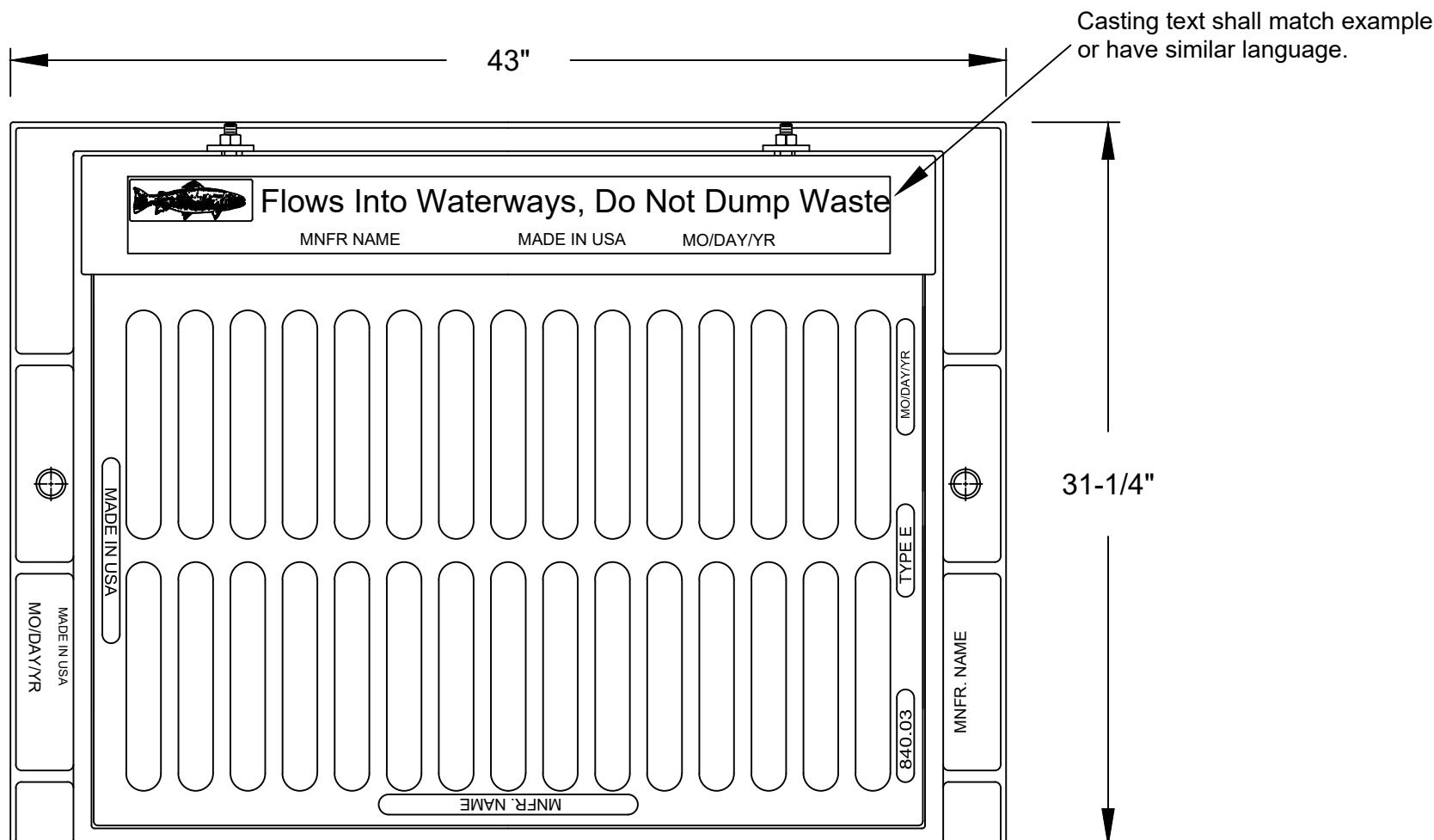
*TYPICAL DRY DETENTION BASIN SECTION*

STANDARD DETAIL NUMBER: HS813

DATE      REVISIONS

7/24/09

TOWN OF HOLLY SPRINGS ENGINEERING DEPARTMENT

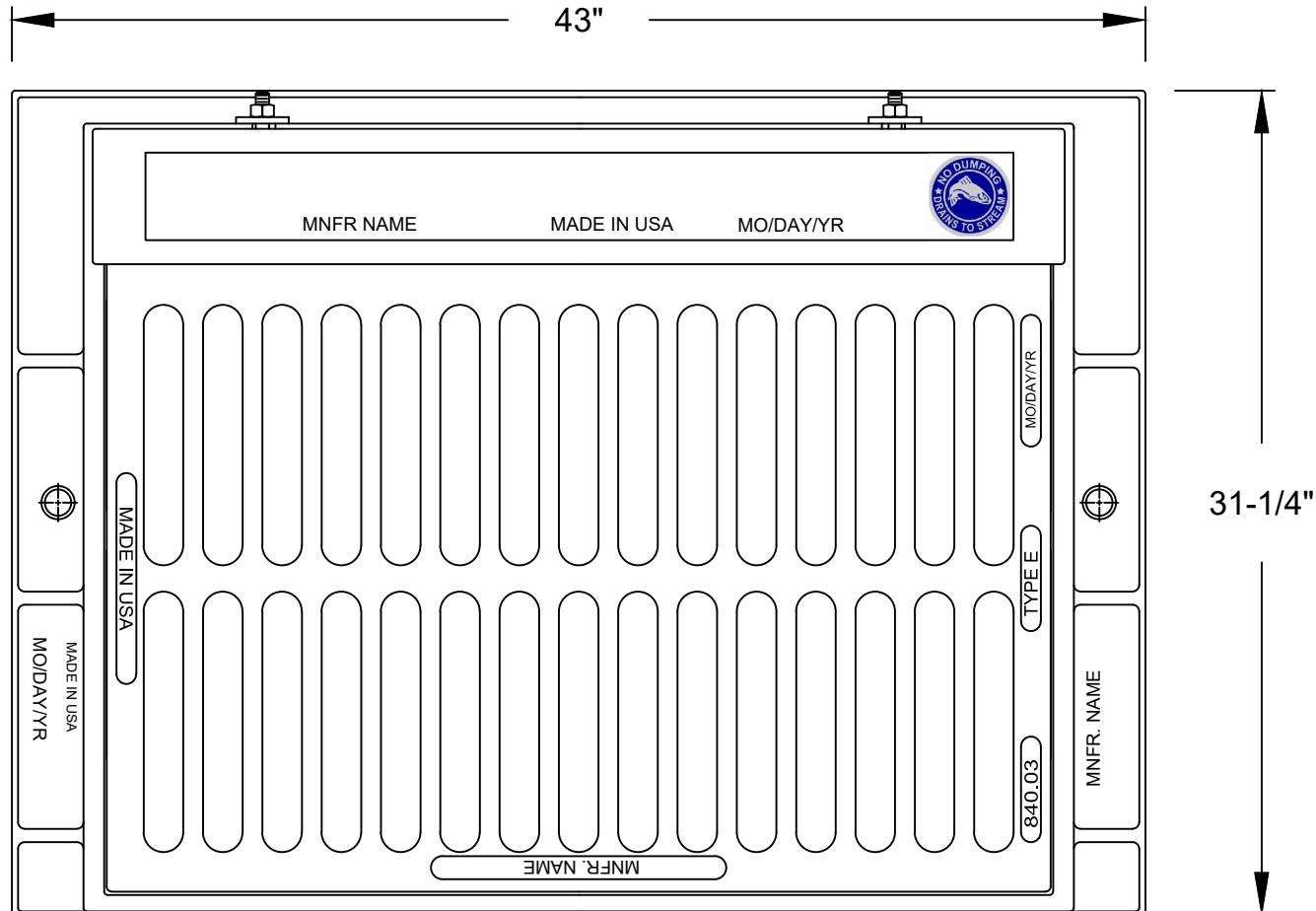


MUST MEET NCDOT STANDARDS  
ROADWAY STANDARD DRAWING 840.03

DRAWING NOT TO SCALE

STANDARD FRAME LABEL FOR CATCH BASIN  
TOWN OF HOLLY SPRINGS ENGINEERING DEPARTMENT

STANDARD DETAIL NUMBER: HS814	
DATE	REVISIONS
7/24/09	



MUST MEET NCDOT STANDARDS  
ROADWAY STANDARD DRAWING 840.03

DRAWING NOT TO SCALE

STANDARD PLACEMENT OF STORM DRAIN MARKER

TOWN OF HOLLY SPRINGS ENGINEERING DEPARTMENT

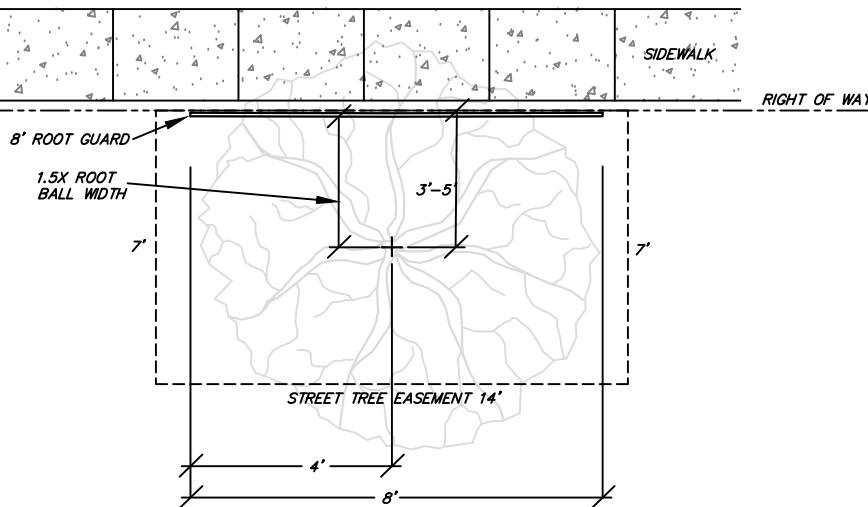
STANDARD DETAIL NUMBER: HS815

DATE REVISIONS

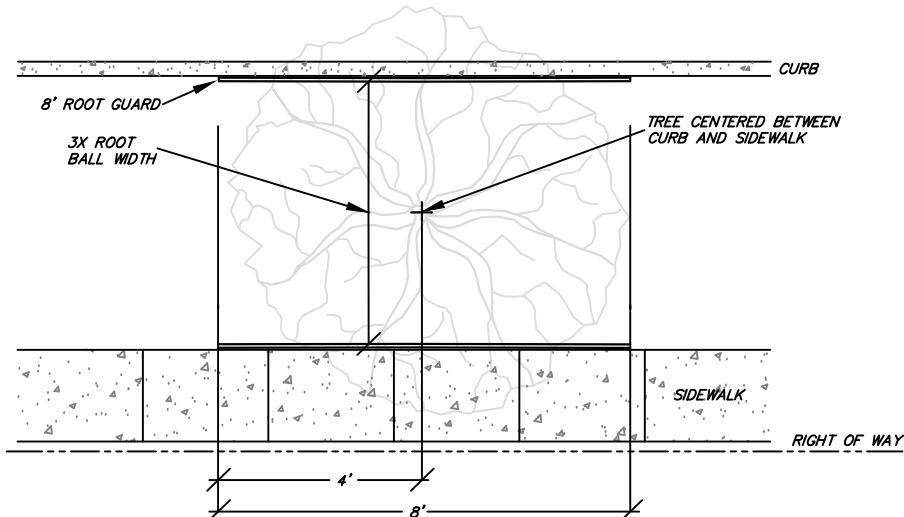
7/24/09



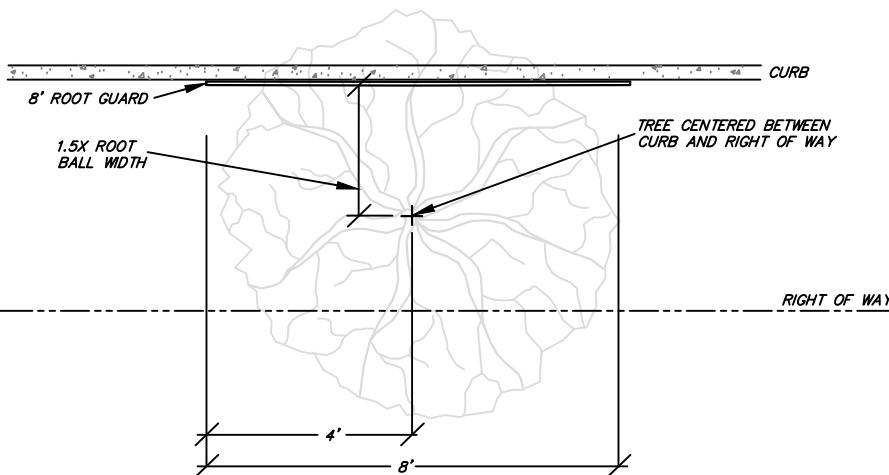
DETAIL A: STREET TREE ON PRIVATE PROPERTY



DETAIL B: STREET TREE IN PUBLIC RIGHT OF WAY WITH SIDEWALK



DETAIL C: STREET TREE IN PUBLIC RIGHT OF WAY WITHOUT SIDEWALK



NOTE: PLACE ROOT GUARD AT EDGE OF CURB OR SIDEWALK.

DRAWING NOT TO SCALE

**STANDARD ROOT GUARD INSTALLATION**

TOWN OF HOLLY SPRINGS ENGINEERING DEPARTMENT

STANDARD DETAIL NUMBER: **HS816**

DATE **7/27/18** REVISIONS



## UB 24-2 Specifications

### 24" DeepRoot Tree Root Barriers

Specified tree root barriers are a mechanical barrier and root defector to prevent tree roots from damaging hardscapes and landscapes. Assembled in 2' long modules to create varying sizes of cylinders for surrounding root balls (Surround planting style) or for linear applications directly beside a hardscape adjacent to one side of the trees (Linear planting style).

#### A. Materials

1. The contractor shall furnish and install tree root barriers as specified. The tree root barriers shall be product # UB 24-2 as manufactured by Deep Root Partners, L.P. 81 Langton St. #4 San Francisco, CA (800-458-7668), or approved equal. The barrier shall be Black, Injection Molded Panels, of 0.085" (2.16mm) wall thickness in modules 24" (61cm) long by 24" (61 cm) deep; manufactured with a minimum 50% post consumer recycled polypropylene plastic with added ultraviolet inhibitors; recyclable. Each panel shall have:

Not less than 4 Molded Integral Vertical Root Deflecting Ribs of at least 0.085" (2.16mm) thickness protruding 1/2" (12.7mm) from interior of the barrier panel, spaced 6" (15.24cm) apart. (See panel drawing below)

A Double Top Edge consisting of two parallel, integral, horizontal ribs at the top of the panel of a minimum 0.085" (2.16mm) thickness, 3/8" (9.53mm) wide and 1/4" (6.35mm) apart with the lower rib attached to the vertical root deflecting ribs. (See detail "A")

A minimum of 9 Anti-Lift Ground Lock Tabs consisting of integral horizontal ridges of a minimum 0.085" (2.16mm) thickness in the shape of a segment of a circle, the 2" (50.8mm) chord of the segment joining the panel wall and the segment, protruding 3/8" (9.53mm) from the panel. The nine ground locks on each panel shall be about equally spaced between each of the vertical root deflecting ribs (3 between each set of ribs, see Detail "B").

An integrated Zipper Joining System providing for instant assembly by sliding one panel into another. (See Detail "C")

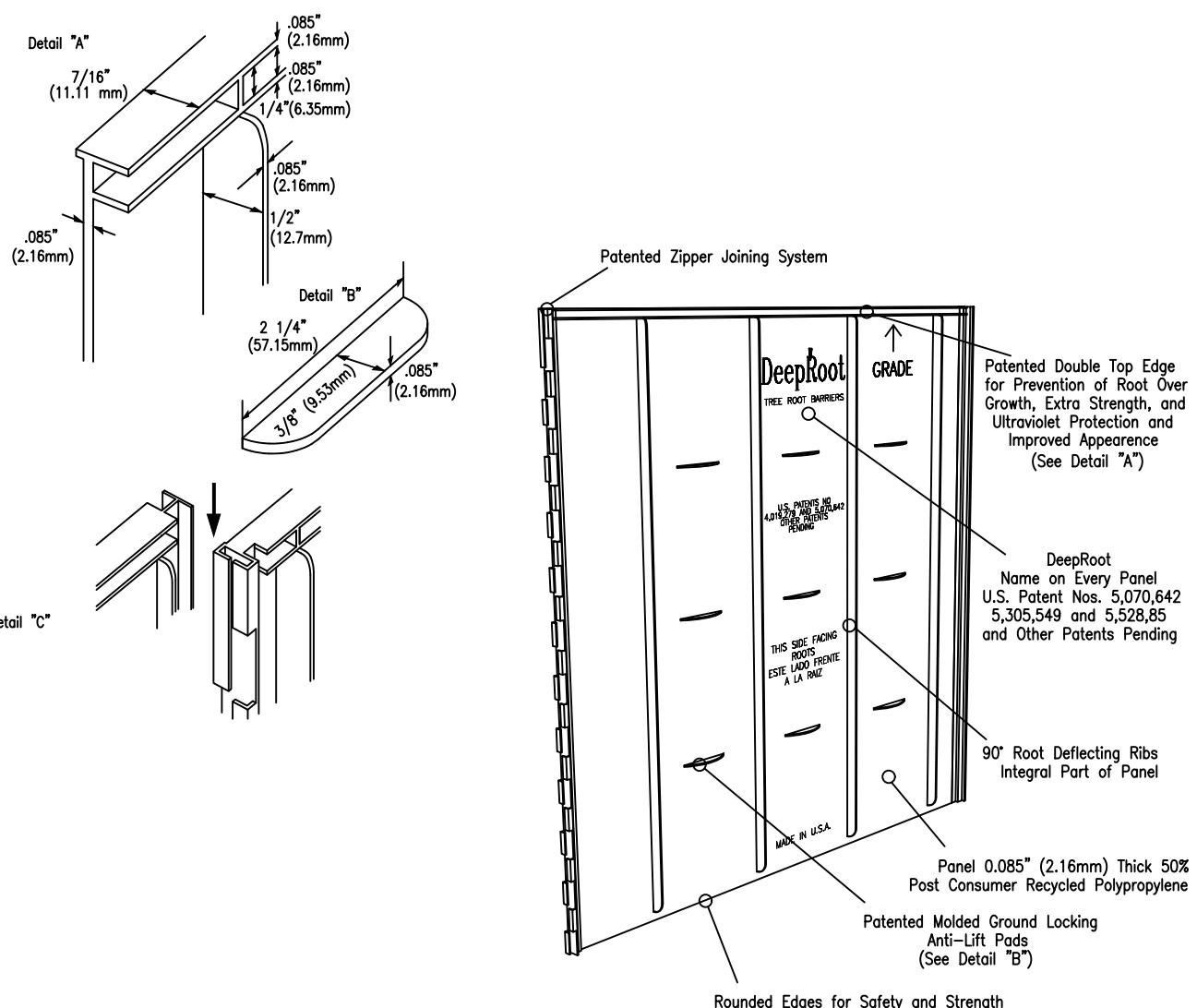
#### 2. The basic properties of the material shall be:

Test	ASTM Test Method	Typical Value	Copolymer Polypropylene
Tensile strength @ yield - Wall	D638	2.354 PSI	
Tensile strength @ yield - Hinge	D638	2.846 PSI	
Yield Elongation - Wall	D638	7.44%	
Yield Elongation - Hinge	D638	7.01%	
Flexural Modulus	D790B	119.625 PSI	
Notched Izod Impact - Wall	D256A	3.84 (ft-lbs)	
Rockwell Hardness r. scale - Wall	D785A	84.4	

#### B. Construction and Installation

1. The contractor shall install the tree root barriers with the number of panels and in the manner shown on the Drawings. The vertical root deflecting ribs shall be facing inwards to the root ball and the double top edge shall be 1/2" (12.7mm) above grade. Each of the required number of panels shall be connected to form a circle around the root ball or joined in a linear fashion and placed along the adjacent hardscape.

2. Excavation and soil preparation shall conform to the Drawings

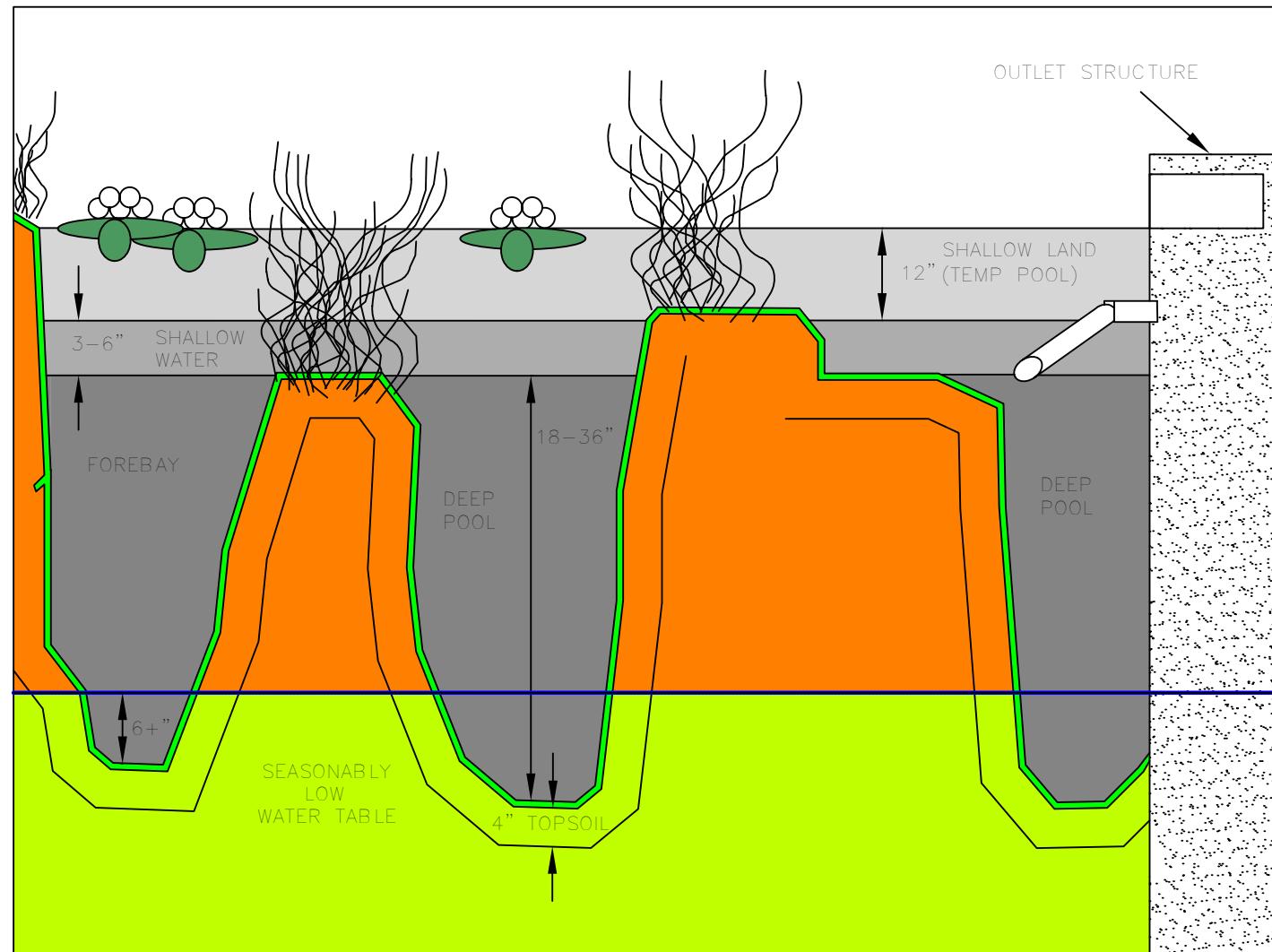


**STANDARD ROOT GUARD**

STANDARD DETAIL NUMBER: HS817

DATE / REVISIONS

TOWN OF HOLLY SPRINGS ENGINEERING DEPARTMENT



DRAWING NOT TO SCALE

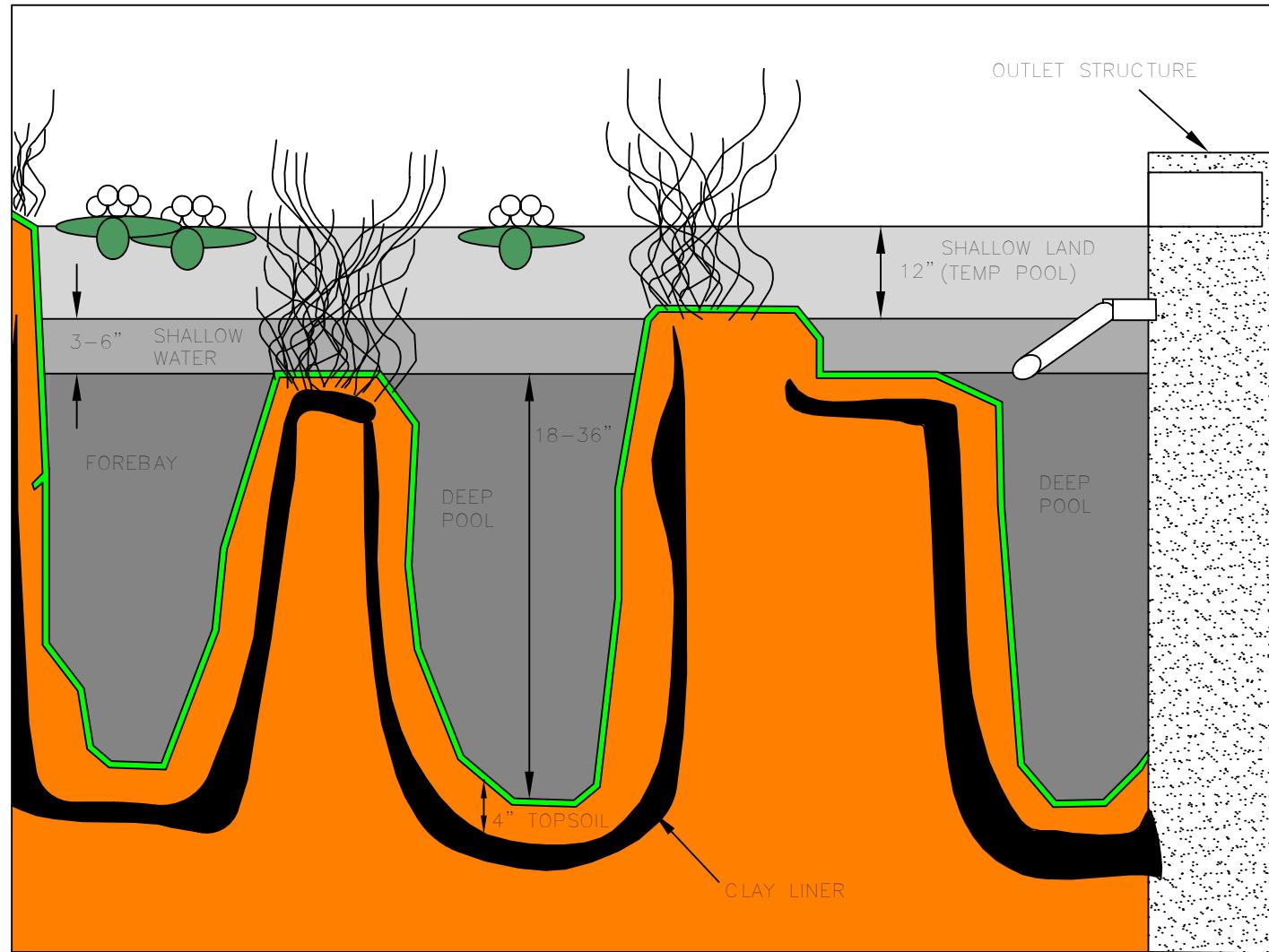
BMP - OPTION 1

TOWN OF HOLLY SPRINGS ENGINEERING DEPARTMENT

STANDARD DETAIL NUMBER HHS818

DATE REVISIONS

9/2/09



DRAWING NOT TO SCALE

BMP - OPTION 2

TOWN OF HOLLY SPRINGS ENGINEERING DEPARTMENT

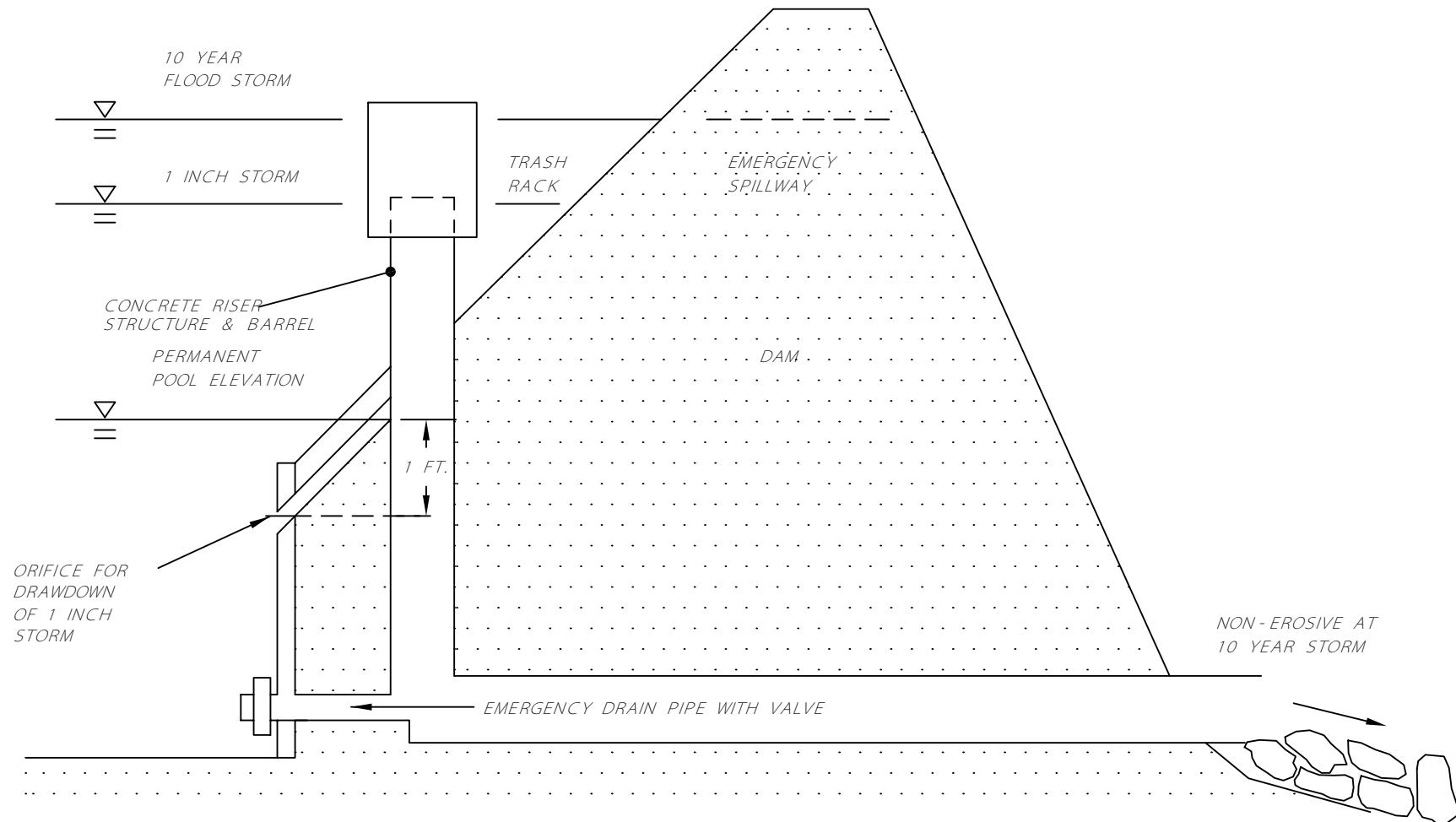
STANDARD DETAIL NUMBER HHS819

DATE

REVISIONS

9/2/09

FIGURE 1



DRAWING NOT TO SCALE

WET DETENTION BASIN

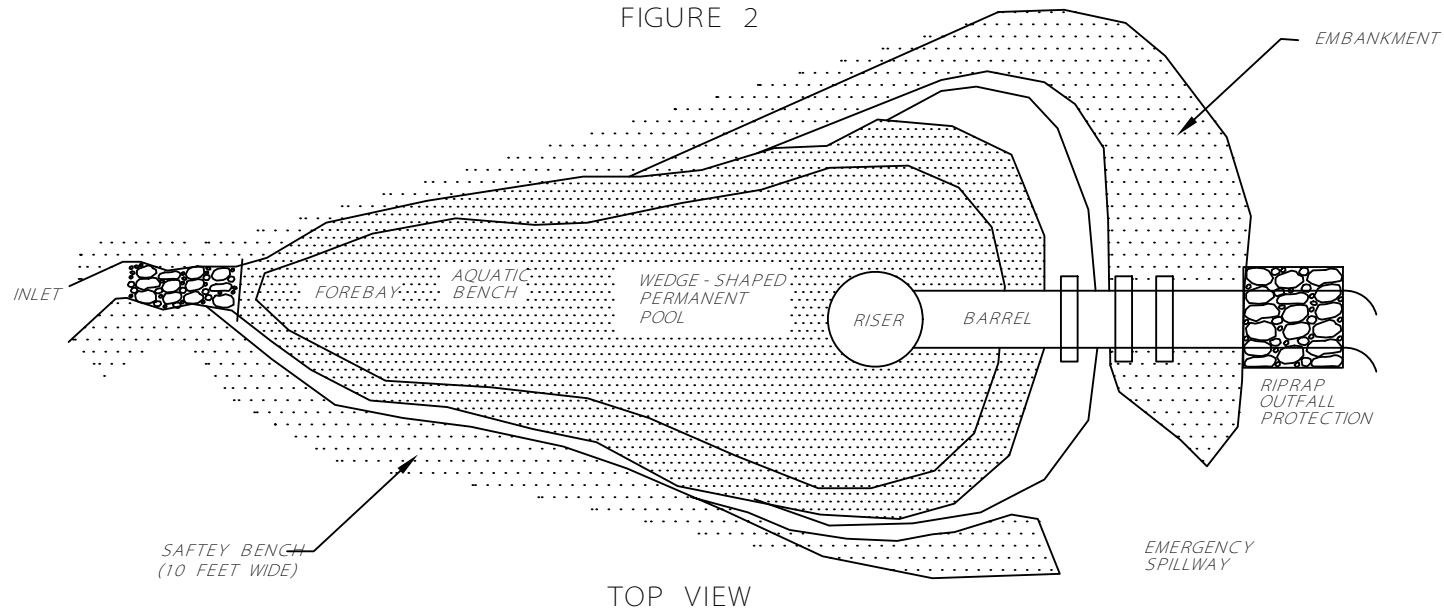
TOWN OF HOLLY SPRINGS ENGINEERING DEPARTMENT

STANDARD DETAIL NUMBER HS820

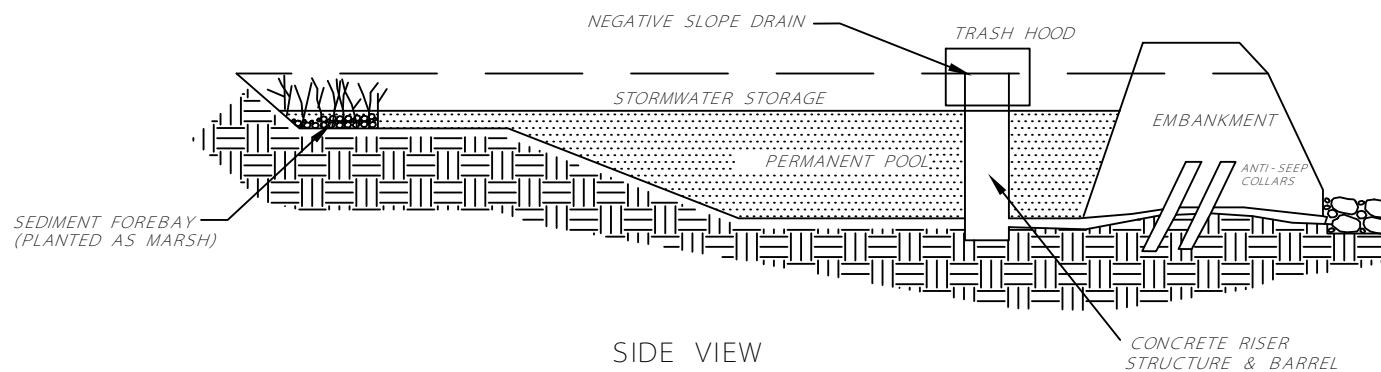
DATE REVISIONS

3/15/10

FIGURE 2



TOP VIEW



SIDE VIEW

DRAWING NOT TO SCALE

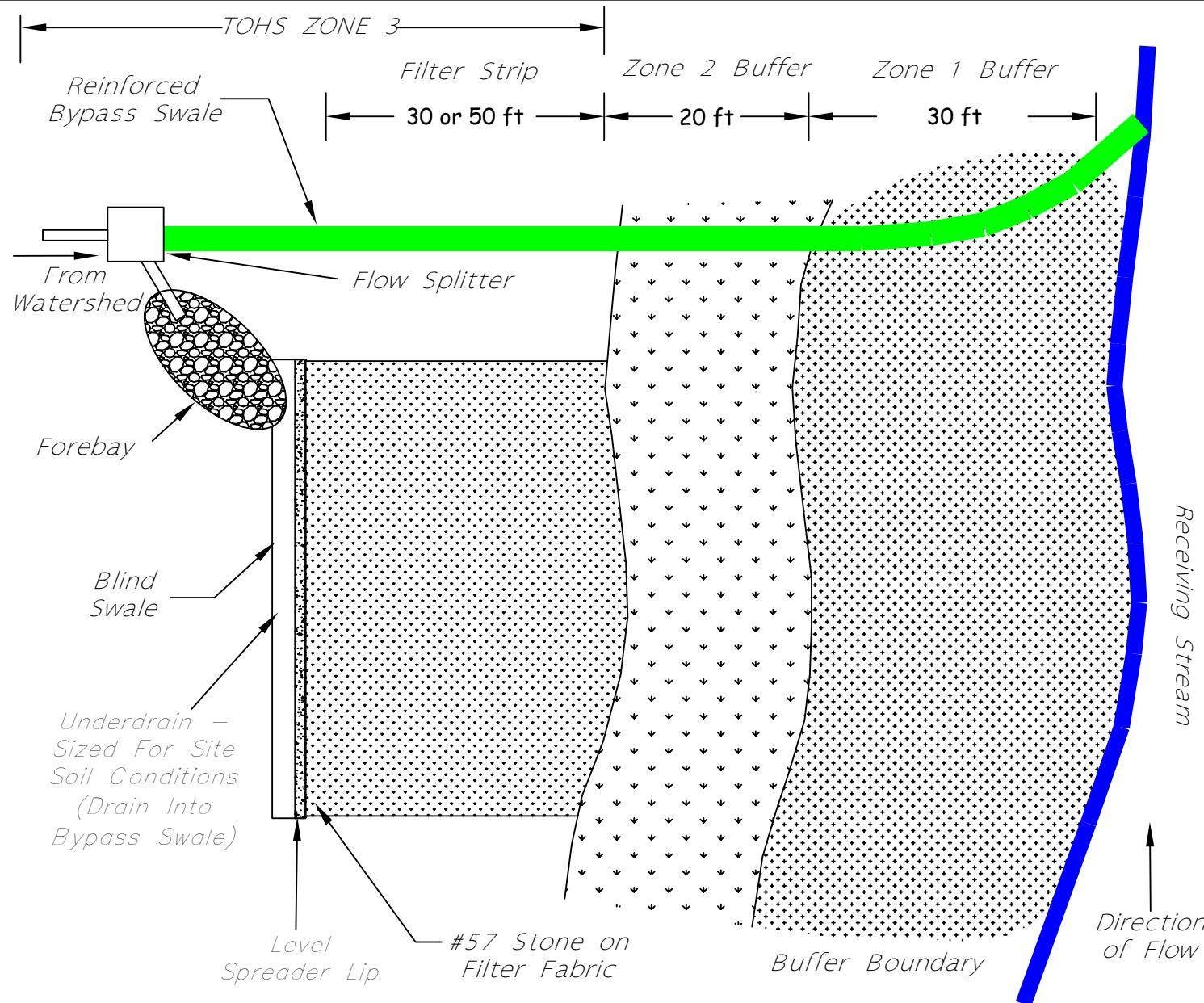
WET DETENTION BASIN DESIGN

TOWN OF HOLLY SPRINGS ENGINEERING DEPARTMENT

STANDARD DETAIL NUMBER: 1S821

DATE | REVISIONS

3/15/10



NOTE:

THIS DEVICE CAN ONLY BE USED IN THE BASS LAKE BUFFER WITH TOWN COUNCIL APPROVAL

DRAWING NOT TO SCALE

LEVEL SPREADER WITH FILTER STRIP

TOWN OF HOLLY SPRINGS ENGINEERING DEPARTMENT

STANDARD DETAIL NUMBER HHS822

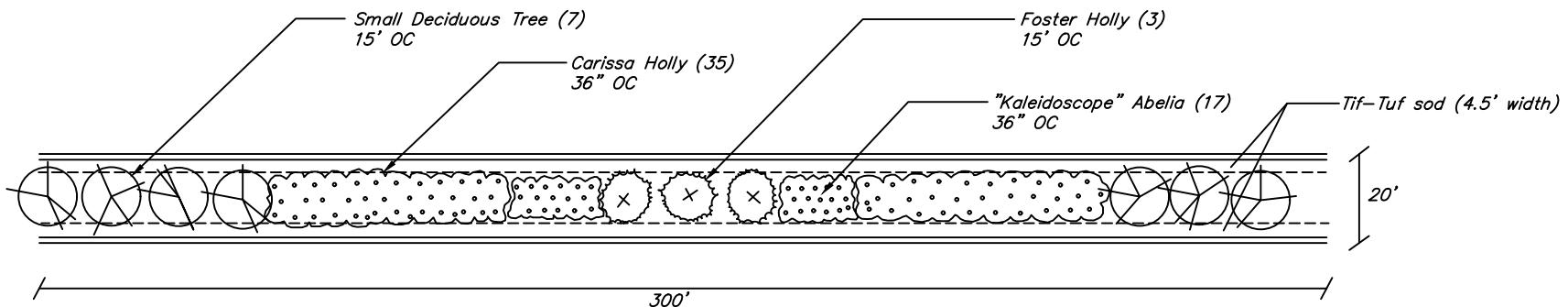
DATE

REVISIONS

8/13/10

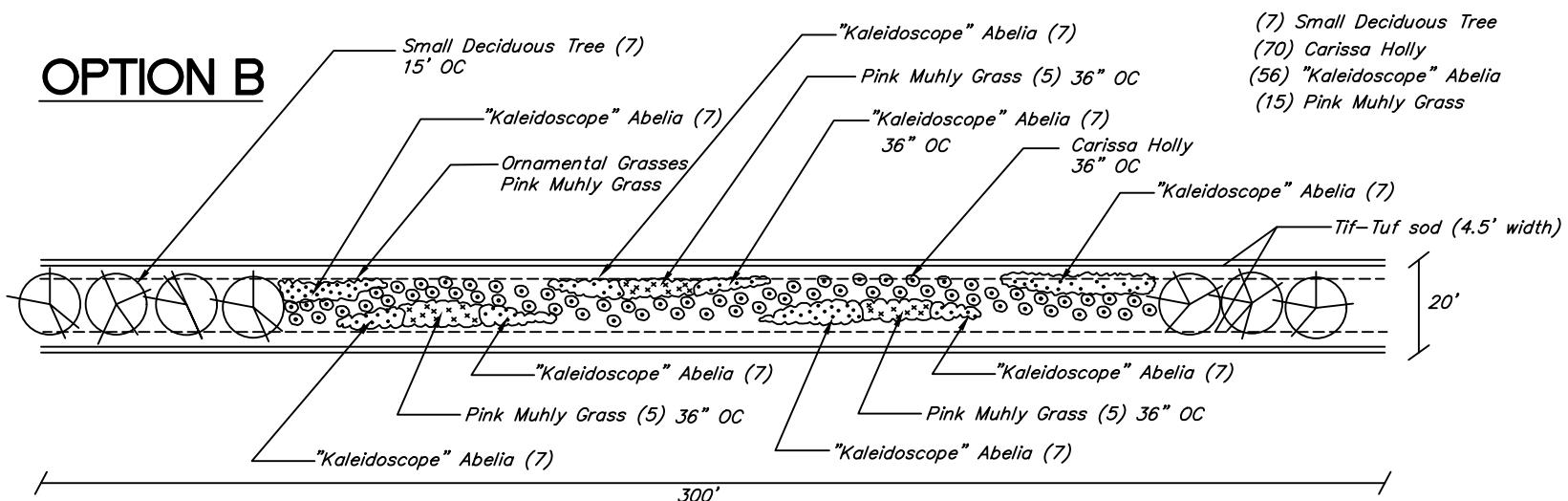
## OPTION A

(7) Small Deciduous Tree  
(3) Foster Holly  
(70) Carissa Holly  
(34) "Kaleidoscope" Abelia



## OPTION B

(7) Small Deciduous Tree  
(70) Carissa Holly  
(56) "Kaleidoscope" Abelia  
(15) Pink Muhly Grass



DRAWING NOT TO SCALE

MEDIAN LANDSCAPING

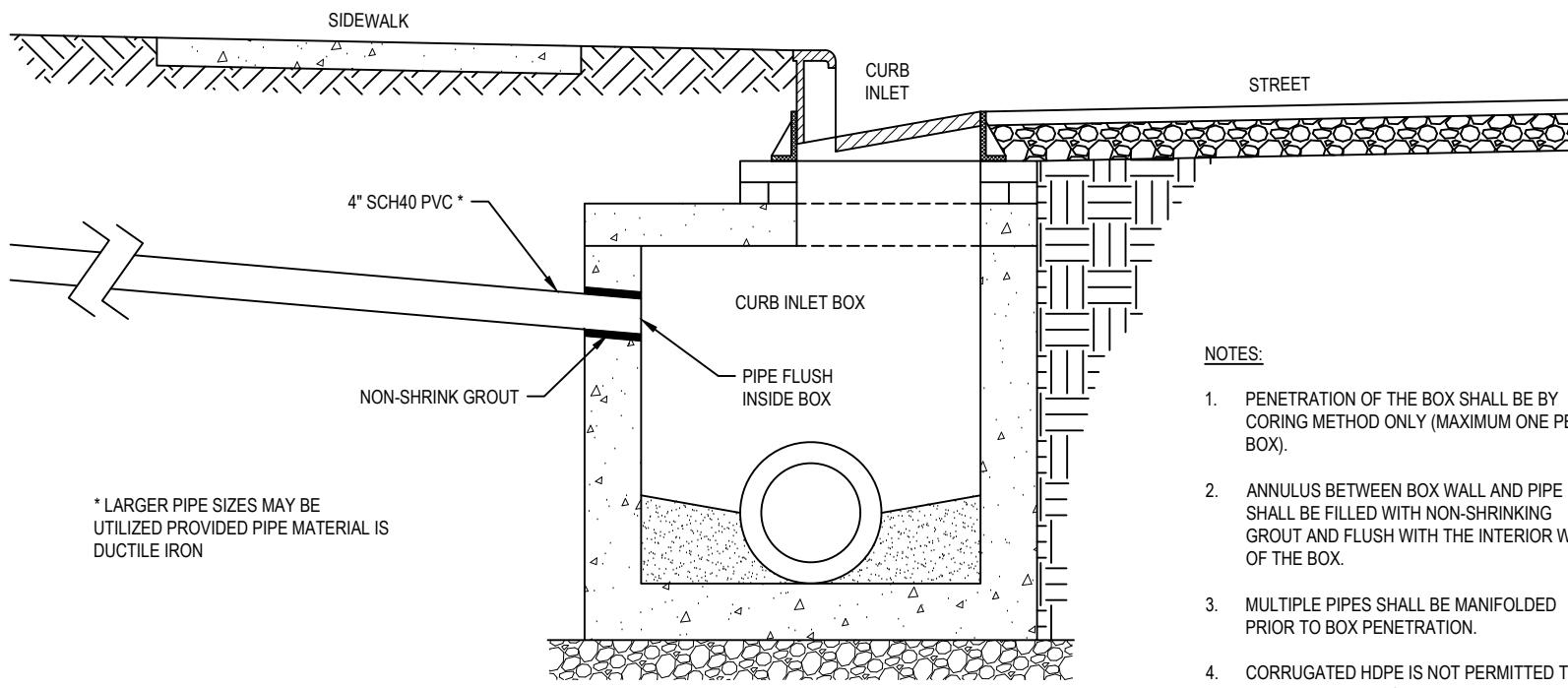
STANDARD DETAIL NUMBER: HS823

DATE REVISIONS

4/5/19

TOWN OF HOLLY SPRINGS ENGINEERING DEPARTMENT





DRAIN CONNECTION TO STORM DRAIN BOX

TOWN OF HOLLY SPRINGS

STANDARD DETAIL NUMBER: HS824

DATE      REVISIONS

12/19/23

