

## K.4 Green Streets Design Standard Drawings

## **Appendix K: Guidance on Green Infrastructure**

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**Green Streets**  
**Supplement to County of San Diego**  
**Design Standard Drawings**



**County of San Diego**  
**Department of Public Works**

February 2016

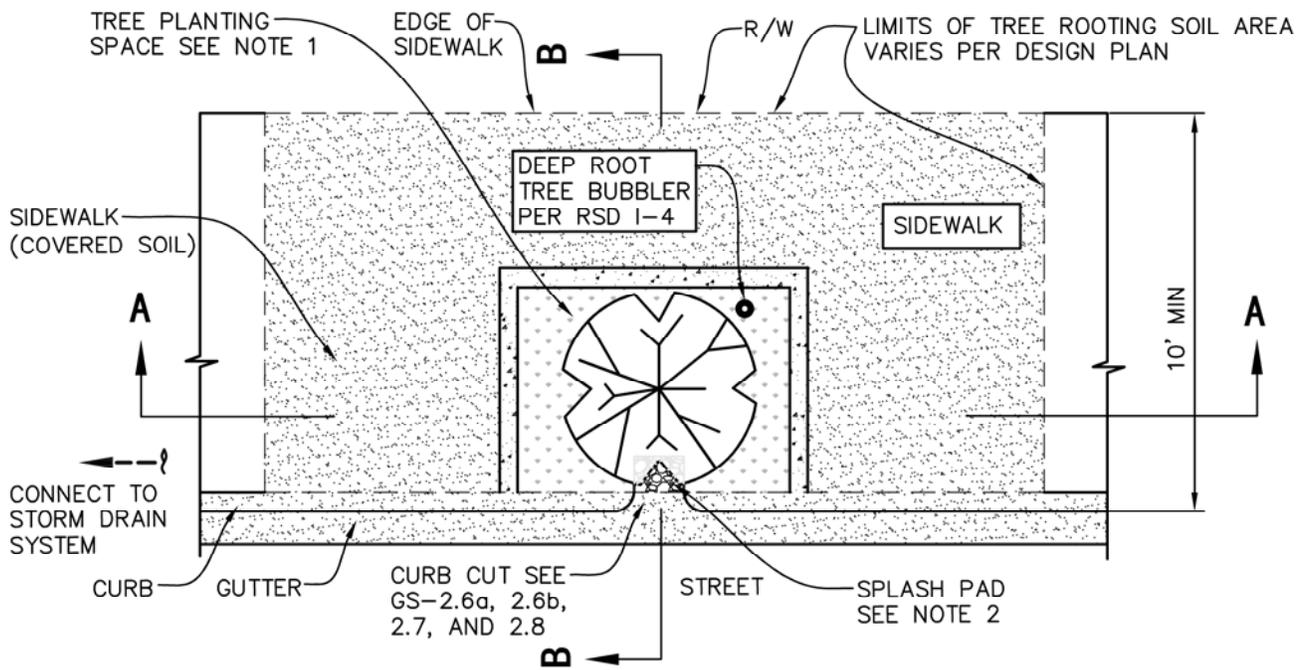
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**SAN DIEGO COUNTY  
DEPARTMENT OF PUBLIC WORKS**

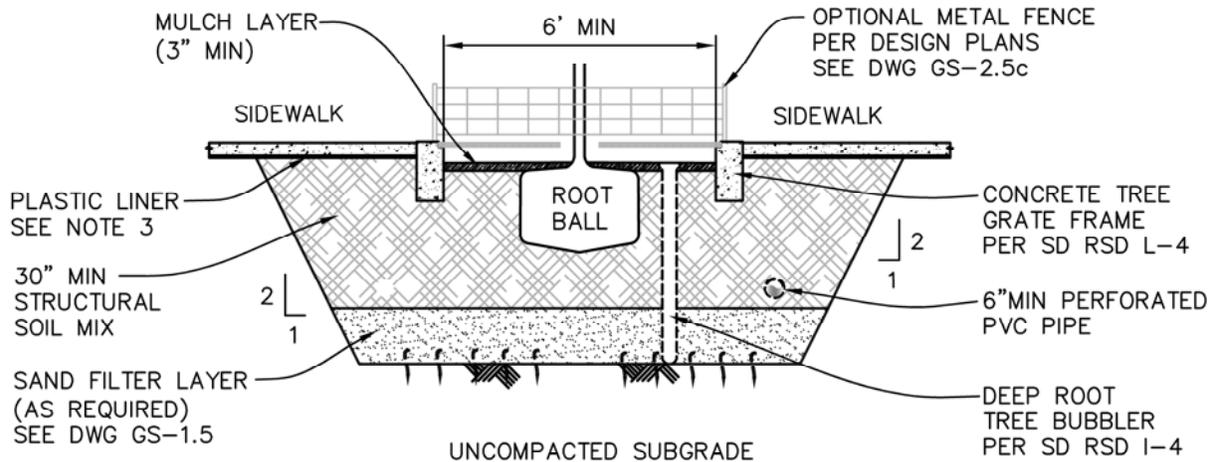
**GREEN STREETS STANDARD DRAWINGS**

<u>NUMBER</u>	<u>TITLE</u>
GS-1.1a	TREE WELL
GS-1.1b	TREE WELL
GS-1.2a	TREE WELL
GS-1.2b	TREE WELL
GS-1.3a	TREE WELL WITH PERMEABLE PAVEMENT
GS-1.3b	TREE WELL WITH PERMEABLE PAVEMENT
GS-1.4a	TREE WELL WITH OPEN TREE SPACE
GS-1.4b	TREE WELL WITH OPEN TREE SPACE
GS-1.5	TREE WELL WITH STRUCTURAL SOIL SUBSURFACE DRAINAGE OPTIONS
GS-2.1	RAIN GARDEN PLANTER ADJACENT TO ROADWAY - 1 (NO STEP OUT ZONE)
GS-2.2	RAIN GARDEN PLANTER ADJACENT TO ROADWAY - 2 (WITH STEP OUT ZONE)
GS-2.3	RAIN GARDEN IN OPEN AREA
GS-2.4	SWALES ADJACENT TO ROADWAY
GS-2.5a	STREET SIDE EDGE TREATMENT -1 (NO STEP OUT ZONE)
GS-2.5b	STREET SIDE EDGE TREATMENT - 2 (WITH STEP OUT ZONE)
GS-2.5c	SIDEWALK SIDE EDGE TREATMENT
GS-2.6a	CURB CUT WITH SPLASH PAD - 1
GS-2.6b	CURB CUT WITH SPLASH PAD - 2
GS-2.7	CURB CUT METAL TRENCH COVER
GS-2.8	GALVANIZED STEEL CHANNEL OVER CURB CUT
GS-3.1a	CURB EXTENSION ADJACENT TO PLANTING STRIP
GS-3.1b	CURB EXTENSION ADJACENT TO PLANTING STRIP
GS-3.2	CURB EXTENSION ADJACENT TO SIDEWALK
GS-3.3	INLET AND OUTLET DETAILS FOR CURB EXTENSION
GS-4.1a	CONCRETE CHECK DAM
GS-4.1b	CONCRETE CHECK DAM
GS-4.2a	ROCK CHECK DAM
GS-4.2b	ROCK CHECK DAM
GS-5.1a	PERMEABLE CONCRETE PAVEMENT
GS-5.1b	PERMEABLE CONCRETE PAVEMENT (SIDEWALK)
GS-5.2a	PERMEABLE ASPHALT PAVEMENT
GS-5.2b	PERMEABLE ASPHALT PAVEMENT (SIDEWALK)
GS-5.3a	PERMEABLE PAVERS
GS-5.3b	PERMEABLE PAVERS (SIDEWALK)
GS-5.4a	PERMEABLE PAVEMENT ELEVATION - 1
GS-5.4b	PERMEABLE PAVEMENT ELEVATION - 2

GS-5.4c	PERMEABLE PAVEMENT CHECK DAMS
GS-5.5	PERMEABLE PAVEMENT EDGE RESTRAINT
GS-6.1	OVERFLOW RISER WITH BEEHIVE GRATE
GS-6.2	STORMWATER FACILITY CLEANOUT/ OBSERVATION WELL
GS-6.3	STORMWATER FACILITY UNDERDRAIN BEDDING AND CATCH BASIN CONNECTION
GS-7.1	GREEN STREET VEGETATED SWALE WITH CURB
GS-7.2	ROCK INFILTRATION SWALE
GS-7.3	RAIN GARDEN / ROCK GARDEN INFILTRATION
GS-7.4	VEGETATED FILTER STRIP



**PLAN VIEW**



**SECTION A-A**

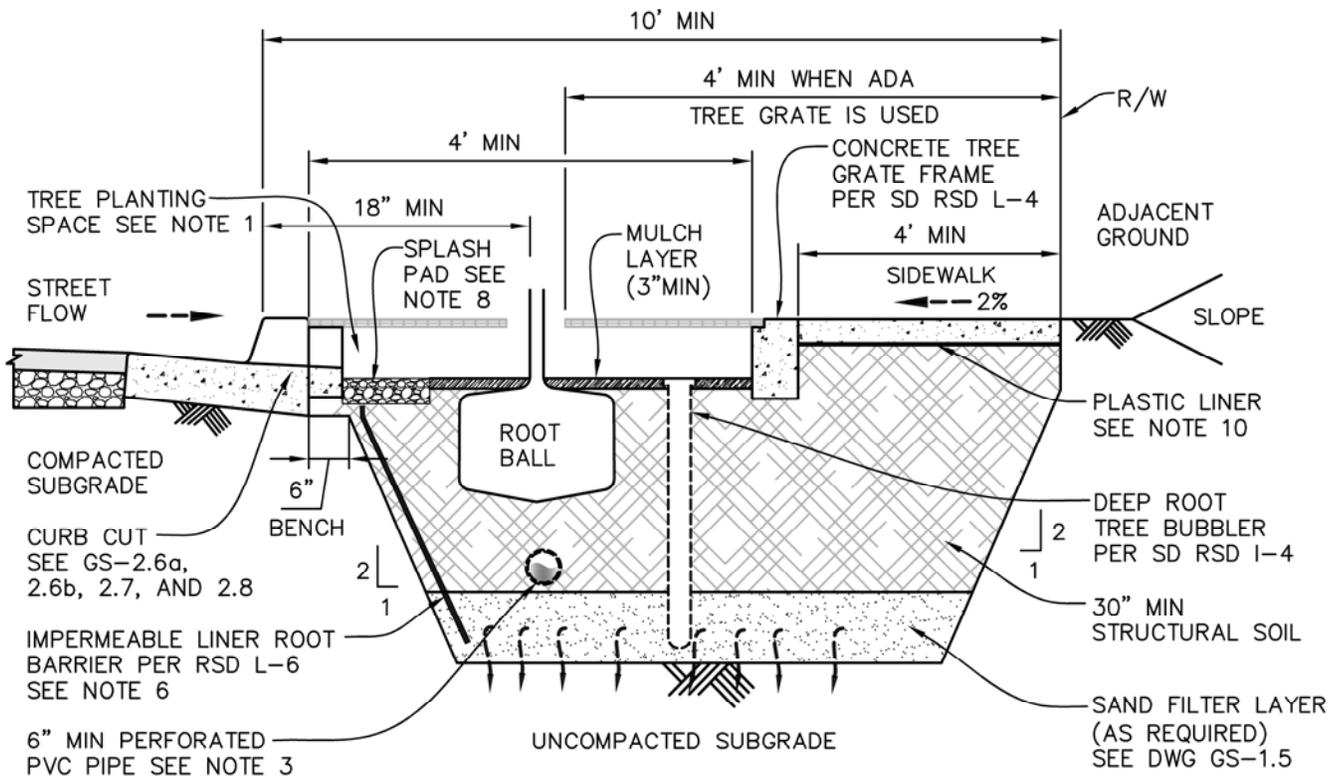
**NOTES:**

1. MINIMUM OPEN TREE PLANTING SPACE DIMENSION 4'x6'.
2. PROVIDE SPLASH PAD FOR TREE PLANTING SPACE PER GS-2.6b.
3. PROVIDE PLASTIC LINER WHERE CONCRETE WILL BE POURED ON TOP OF STRUCTURAL SOIL PER GREEN BOOK STANDARD SPECIFICATIONS SECTION 210-2.

DRAWING NOT TO SCALE

DRAWN BY: <u>M.M.</u>	CHECKED BY: <u>S.W.K.</u>	<b>SAN DIEGO COUNTY DESIGN STANDARD</b>	REVISIONS	APPROVED	DATE
RECOMMENDED BY: <u>STUART W. KUHN, P.E.</u>	APPROVED BY COUNTY ENGINEER				
DATE: _____		<b>TREE WELL</b>	<b>DRAWING NUMBER GS-1.1a</b>		
DEYLAMIAN SIROUS, P.E. R.C.E. NO. 53192, EXP 6/30/2017					

**NOTE: THIS DRAWING IS TO BE INCLUDED ON PLANS UNTIL SIGNED BY THE COUNTY ENGINEER. ONCE SIGNED, IT CAN BE REFERENCED BY NUMBER**



**SECTION B-B**

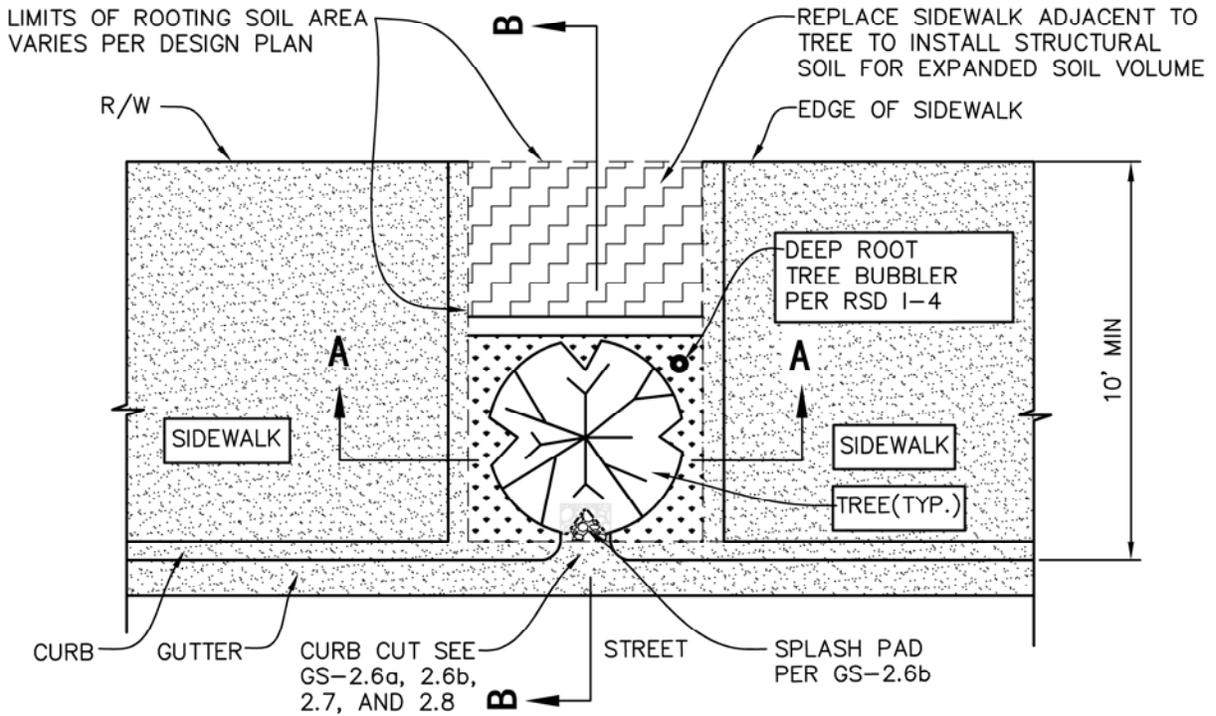
**NOTES:**

1. MINIMUM OPEN TREE PLANTING SPACE DIMENSION 4'x6'.
2. MAXIMUM WATERSHED AREA: 6 TIMES AREA OF THE OPEN TREE PLANTING AREA.
3. SEE DWG GS-1.5 FOR BOTTOM SAND LAYER AND SUBSURFACE DRAINAGE REQUIREMENTS.
4. FOR SIDEWALK OVER STRUCTURAL SOIL DETAIL OPTIONS, SEE DWG GS-1.5.
5. SEE SD RSD DWG L-1 THROUGH L-4 FOR TREE INSTALLATION REQUIREMENTS.
6. PROVIDE 18" DEEP ROOT BARRIER ON STREET SIDE OF TREE WELL AS NECESSARY.
7. REMOVE WIRE AND BURLAP FROM ROOT BALL PRIOR TO BACKFILLING.
8. PROVIDE SPLASH PAD FOR TREE PLANTING SPACE PER GS-2.6b.
9. IN SOME INSTANCES A MODIFIED SECTION BELOW CURB MAY BE REQUIRED BASED ON SOIL CONDITIONS.
10. PROVIDE PLASTIC LINER WHERE CONCRETE WILL BE POURED ON TOP OF STRUCTURAL SOIL PER GREEN BOOK STANDARD SPECIFICATIONS SECTION 210-2.

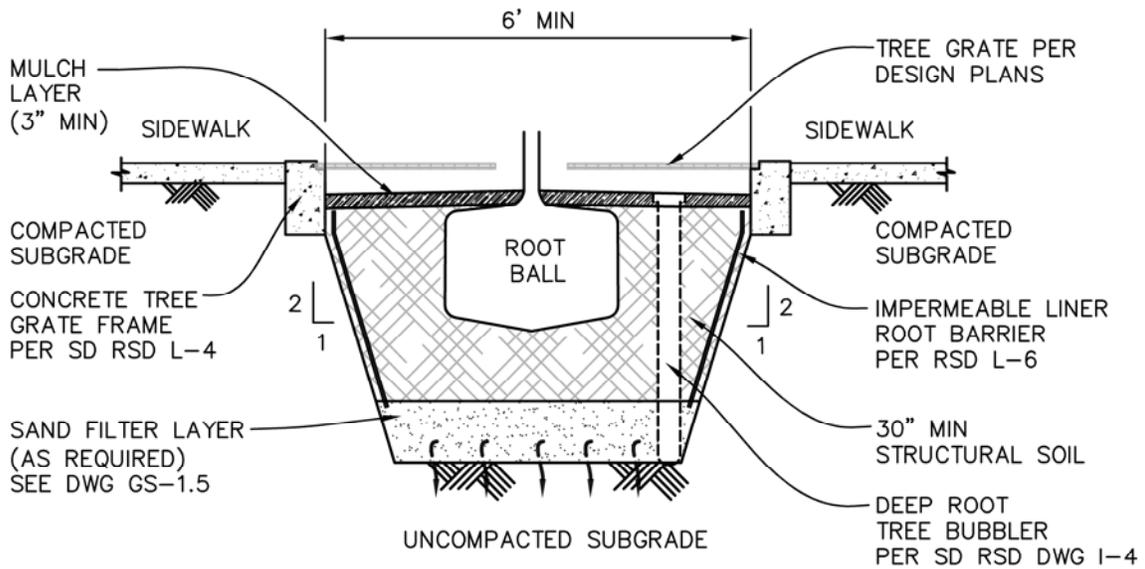
DRAWING NOT TO SCALE

DRAWN BY: <u>M.M.</u>	CHECKED BY: <u>S.W.K.</u>	<b>SAN DIEGO COUNTY DESIGN STANDARD</b>	REVISIONS	APPROVED	DATE
RECOMMENDED BY: <u>STUART W. KUHN, P.E.</u>					
APPROVED BY COUNTY ENGINEER					
DATE: _____		<b>TREE WELL</b>	<b>DRAWING NUMBER GS-1.1b</b>		
DEYLAMIAN SIROUS, P.E. R.C.E. NO. 53192, EXP 6/30/2017					

**NOTE: THIS DRAWING IS TO BE INCLUDED ON PLANS UNTIL SIGNED BY THE COUNTY ENGINEER. ONCE SIGNED, IT CAN BE REFERENCED BY NUMBER**



**PLAN VIEW**



**SECTION A-A**

DRAWING NOT TO SCALE

DRAWN BY: M.M. CHECKED BY: S.W.K.  
 RECOMMENDED BY: STUART W. KUHN, P.E.  
 APPROVED BY COUNTY ENGINEER  
 DATE: \_\_\_\_\_  
 DEYLAMIAN SIROUS, P.E.  
 R.C.E. NO. 53192, EXP 6/30/2017

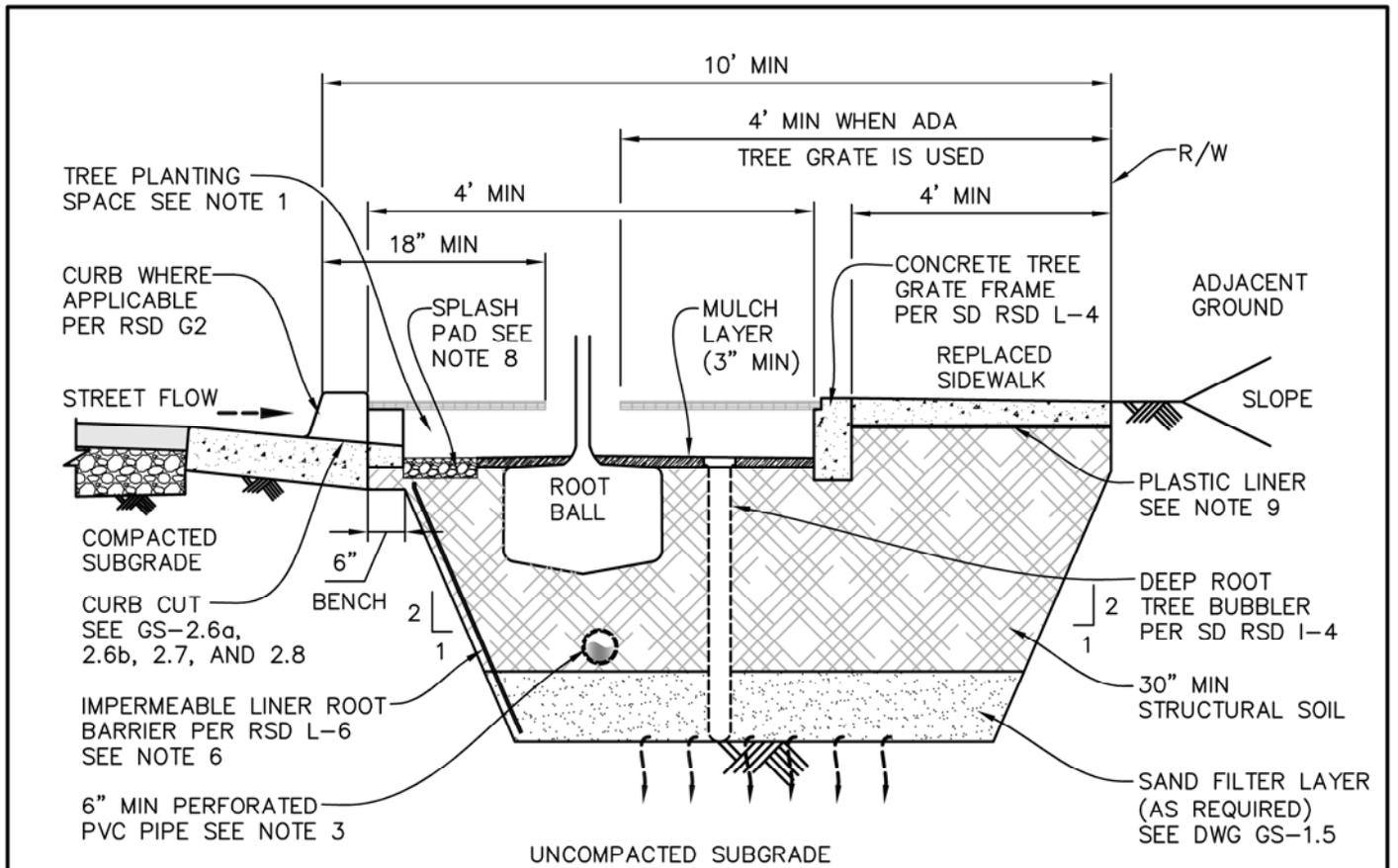
SAN DIEGO COUNTY DESIGN STANDARD

**TREE WELL**

REVISIONS	APPROVED	DATE

DRAWING NUMBER **GS-1.2a**

**NOTE; THIS DRAWING IS TO BE INCLUDED ON PLANS UNTIL SIGNED BY THE COUNTY ENGINEER. ONCE SIGNED, IT CAN BE REFERENCED BY NUMBER**



**SECTION B-B**

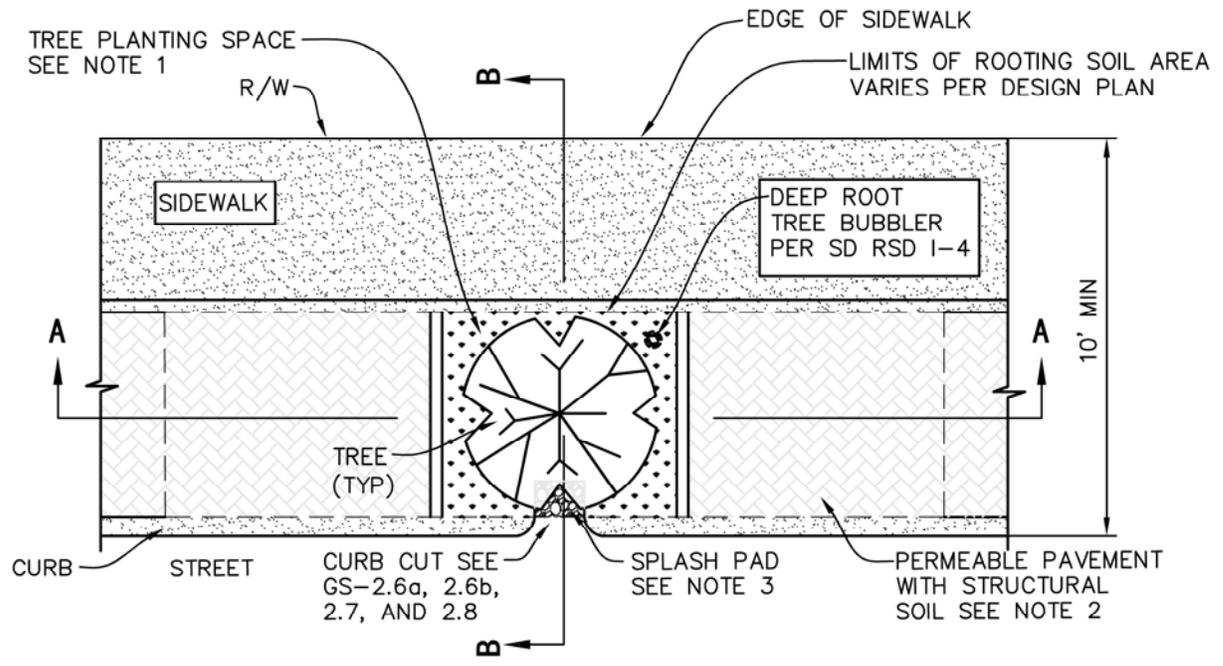
**NOTES:**

1. MINIMUM OPEN TREE PLANTING SPACE DIMENSION 4'x6'.
2. MAXIMUM WATERSHED AREA: 6 TIMES AREA OF THE OPEN TREE PLANTING AREA.
3. SEE DWG GS-1.5 FOR BOTTOM SAND LAYER AND SUBSURFACE DRAINAGE REQUIREMENTS.
4. DETAIL INTENDED FOR NEW TREE PLANTINGS ON SITES WITH CONSTRAINTS TO ACHIEVE FULL SOIL VOLUME.
5. TO ADAPT DETAIL TO EXISTING TREE LOCATION, PROVIDE EXPANDED SOIL VOLUMES BEYOND EXISTING TREE ROOTING AREA; DO NOT DISTURB AROUND EXISTING TREE ROOT.
6. PROVIDE 18" DEEP ROOT BARRIER ON STREET SIDE OF TREE WELL AS NECESSARY.
7. SEE SD RSD DWG L-1 THRU L-4 FOR TREE INSTALLATION REQUIREMENTS.
8. PROVIDE SPLASH PAD FOR TREE PLANTING SPACE PER GS-2.6b.
9. PROVIDE PLASTIC LINER WHERE CONCRETE WILL BE POURED ON TOP OF STRUCTURAL SOIL PER GREEN BOOK STANDARD SPECIFICATIONS SECTION 210-2.

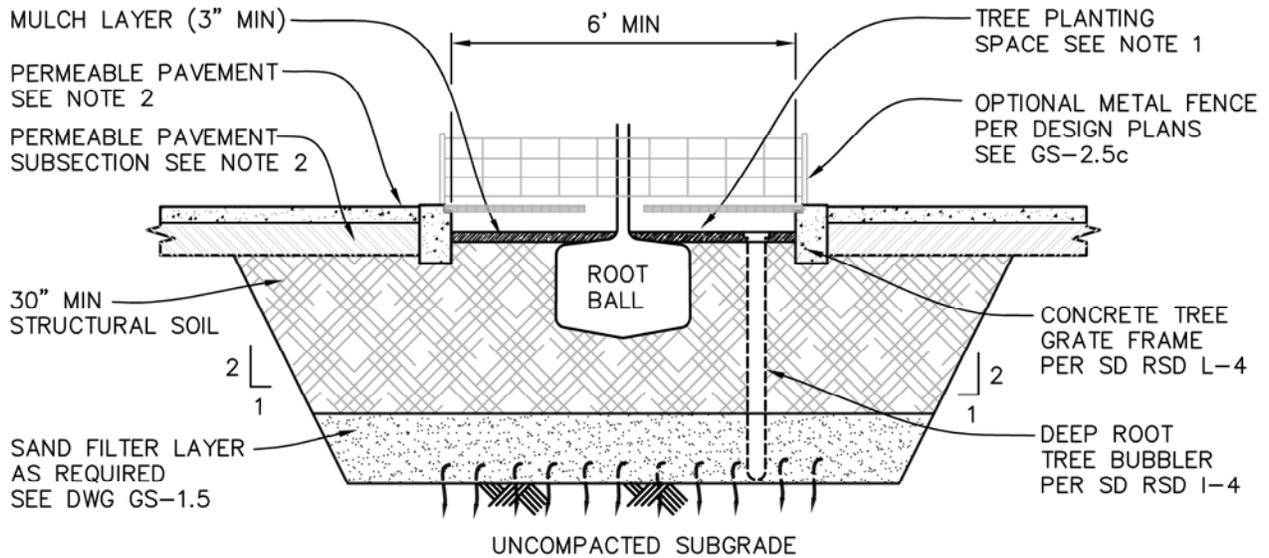
DRAWING NOT TO SCALE

DRAWN BY: <u>M.M.</u>	CHECKED BY: <u>S.W.K.</u>	<b>SAN DIEGO COUNTY DESIGN STANDARD</b>	REVISIONS	APPROVED	DATE
RECOMMENDED BY: <u>STUART W. KUHN, P.E.</u>					
APPROVED BY COUNTY ENGINEER		<b>TREE WELL</b>			
DATE: _____					
DEYLAMIAN SIROUS, P.E. R.C.E. NO. 53192, EXP 6/30/2017			DRAWING NUMBER <b>GS-1.2b</b>		

**NOTE: THIS DRAWING IS TO BE INCLUDED ON PLANS UNTIL SIGNED BY THE COUNTY ENGINEER. ONCE SIGNED, IT CAN BE REFERENCED BY NUMBER**



**PLAN VIEW**



**SECTION A-A**

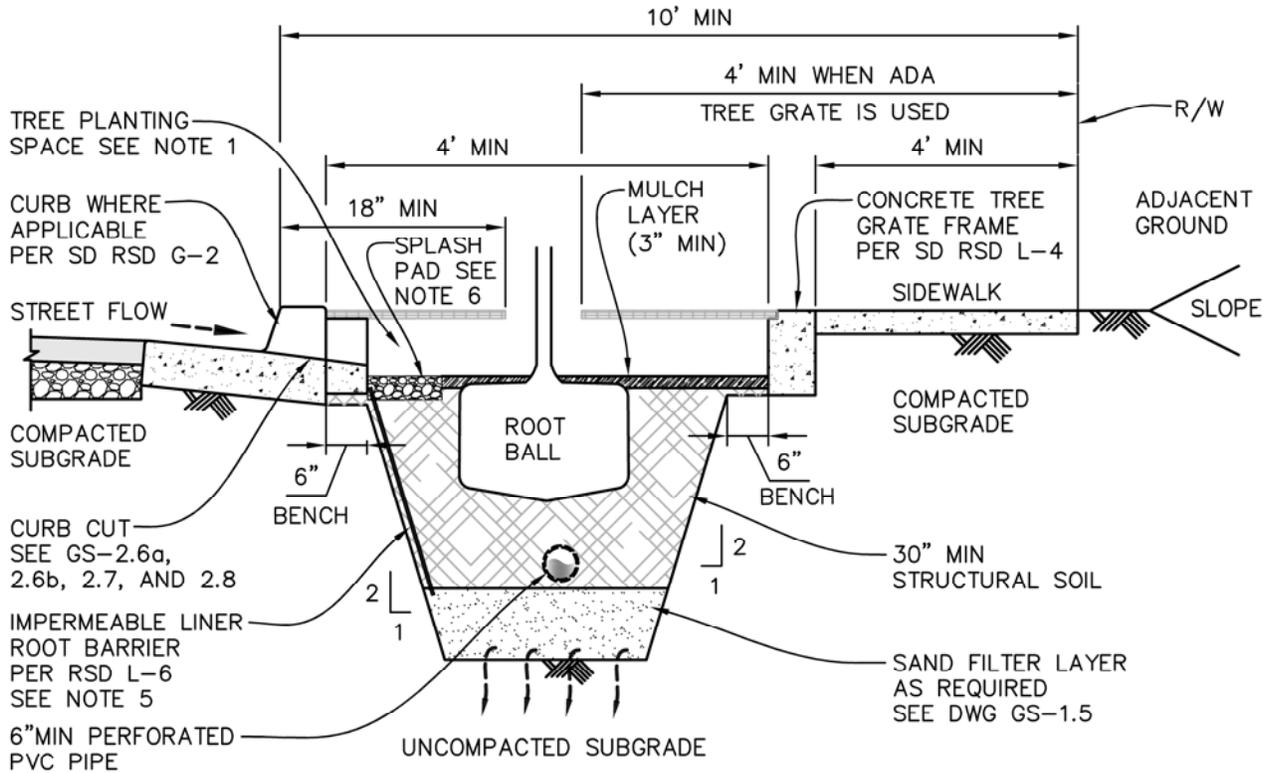
**NOTES:**

1. MINIMUM OPEN TREE PLANTING SPACE DIMENSION 4'x6'.
2. SEE DRAWING GS-5.1, GS-5.2, AND GS-5.3 FOR PERMEABLE PAVEMENT DETAIL OPTIONS.
3. PROVIDE SPLASH PAD FOR TREE PLANTING SPACE PER GS-2.6b.

DRAWING NOT TO SCALE

DRAWN BY: <u>M.M.</u>	CHECKED BY: <u>S.W.K.</u>	SAN DIEGO COUNTY DESIGN STANDARD	REVISIONS	APPROVED	DATE
RECOMMENDED BY: <u>STUART W. KUHN, P.E.</u>	APPROVED BY COUNTY ENGINEER				
DATE: _____		<b>TREE WELL WITH PERMEABLE PAVEMENT</b>	DRAWING NUMBER <b>GS-1.3a</b>		
DEYLAMIAN SIROUS, P.E. R.C.E. NO. 53192, EXP 6/30/2017					

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**SECTION B-B**

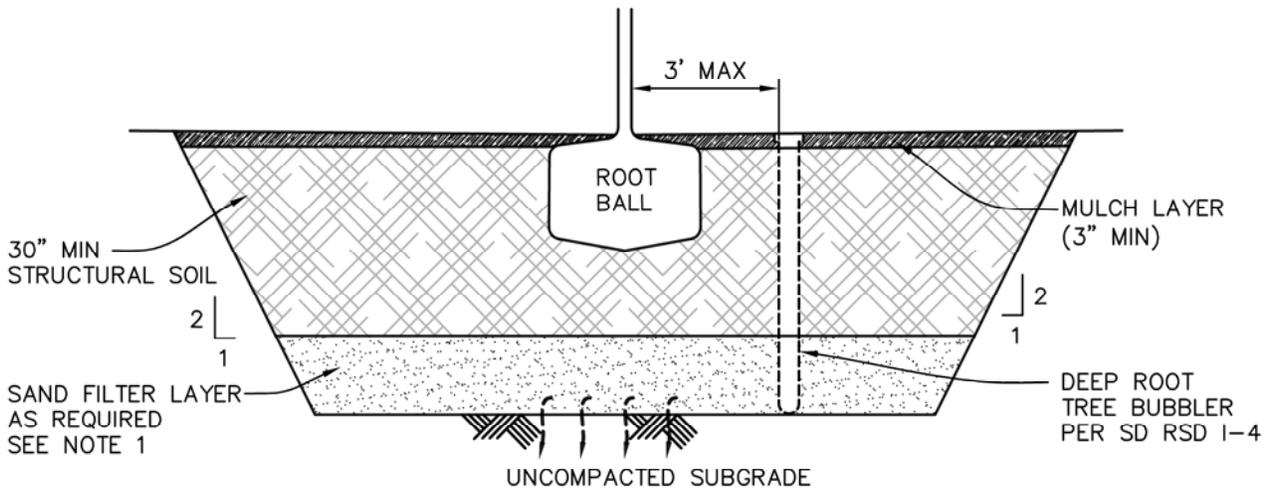
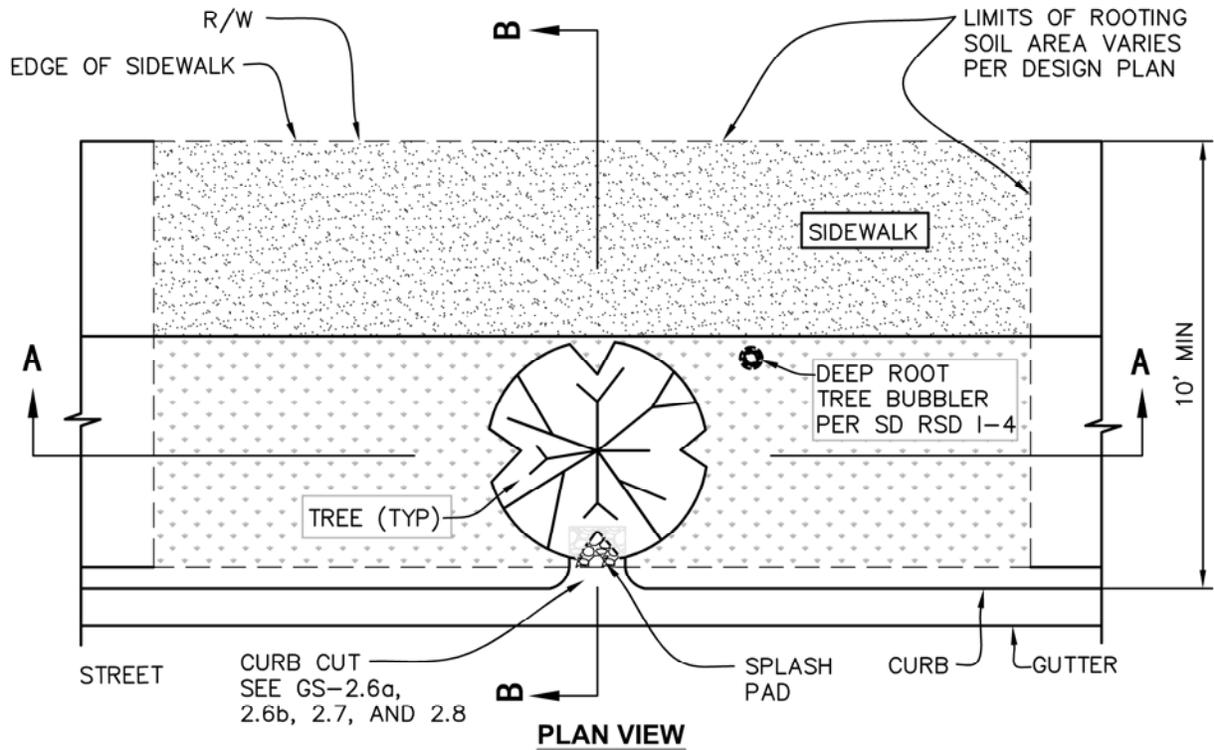
**NOTES:**

1. MINIMUM TREE PLANTING SPACE DIMENSION 4'X6'.
2. MAXIMUM WATERSHED AREA: 6 TIMES AREA OF THE TREE PLANTING BED.
3. DETAIL INTENDED FOR NEW TREE PLANTINGS ON SITES WITH CONSTRAINTS TO ACHIEVE FULL SOIL VOLUME.
4. TO ADAPT DETAIL TO EXISTING TREE LOCATION, PROVIDE EXPANDED SOIL VOLUMES BEYOND EXISTING TREE ROOTING AREA; DO NOT DISTURB AROUND EXISTING TREE ROOT.
5. PROVIDE 18" DEEP ROOT BARRIER ON STREET SIDE OF TREE WELL AS NECESSARY.
6. PROVIDE SPLASH PAD FOR TREE PLANTING SPACE PER GS-2.6b.

DRAWING NOT TO SCALE

DRAWN BY: <u>M.M.</u>	CHECKED BY: <u>S.W.K.</u>	<b>SAN DIEGO COUNTY DESIGN STANDARD</b>	REVISIONS	APPROVED	DATE
RECOMMENDED BY: <u>STUART W. KUHN, P.E.</u>					
APPROVED BY COUNTY ENGINEER		<b>TREE WELL WITH PERMABLE PAVEMENT</b>			
DATE: _____			DRAWING NUMBER <b>GS-1.3b</b>		
DEYLAMIAN SIROUS, P.E. R.C.E. NO. 53192, EXP 6/30/2017					

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**SECTION A-A**

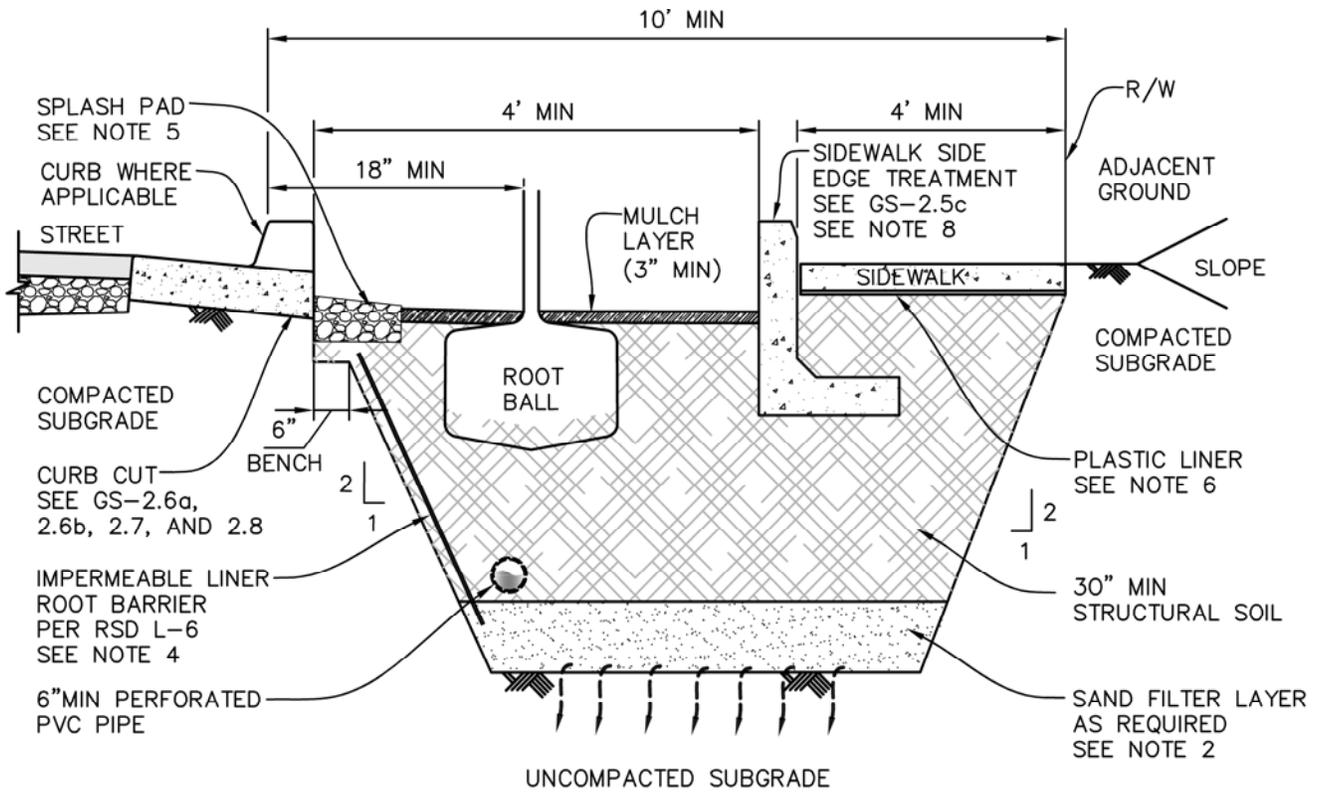
**NOTES:**

1. SEE DRAWING GS-1.5 FOR BOTTOM SAND FILTER LAYER AND SUBSURFACE DRAINAGE REQUIREMENTS.

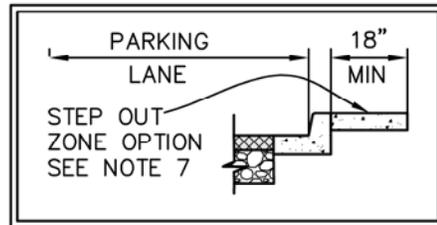
DRAWING NOT TO SCALE

DRAWN BY: <u>M.M.</u> CHECKED BY: <u>S.W.K.</u> RECOMMENDED BY: <u>STUART W. KUHN, P.E.</u> APPROVED BY COUNTY ENGINEER DATE: _____ DEYLAMIAN SIROUS, P.E. R.C.E. NO. 53192, EXP 6/30/2017	<b>SAN DIEGO COUNTY DESIGN STANDARD</b>  <b>TREE WELL</b> <b>WITH OPEN TREE SPACE</b>	REVISIONS    APPROVED    DATE   DRAWING NUMBER <b>GS-1.4a</b>
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**NOTE: THIS DRAWING IS TO BE INCLUDED ON PLANS UNTIL SIGNED BY THE COUNTY ENGINEER. ONCE SIGNED, IT CAN BE REFERENCED BY NUMBER**



**SECTION B-B**



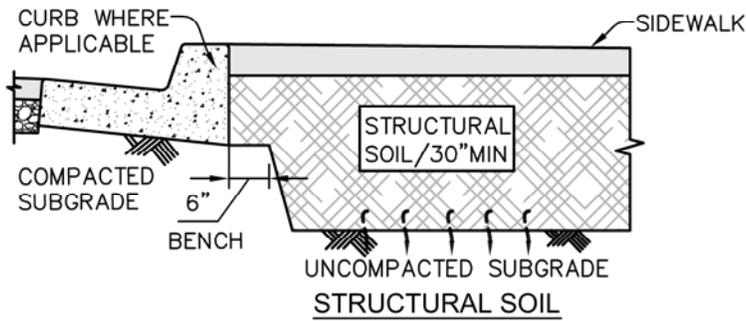
**NOTES:**

1. MAXIMUM WATERSHED AREA : 6 TIMES AREA OF THE TREE PLANTING BED.
2. SEE DWG GS-1.5 FOR BOTTOM SAND LAYER AND SUBSURFACE DRAINAGE REQUIREMENTS.
3. SEE SD RSD DWG L-1 THRU L-4 FOR TREE INSTALLATION REQUIREMENTS.
4. PROVIDE 18 " DEEP ROOT BARRIER ON STREET SIDE AS NECESSARY.
5. PROVIDE SPLASH PAD FOR TREE PLANTING SPACE PER GS-2.6b.
6. PROVIDE PLASTIC LINER WHERE CONCRETE WILL BE POURED ON TOP OF STRUCTURAL SOIL PER GREEN BOOK STANDARD SPECIFICATIONS SECTION 210-2.
7. 18" MINIMUM STEP OUT ZONE IS REQUIRED WHEN PARALLEL PARKING IS PROVIDED.
8. A 3 TO 1 SLOPE MAY BE USED IN LIEU OF THE L-WALL WHERE ADEQUATE SPACE IS AVAILABLE SEE GS-3.1b.

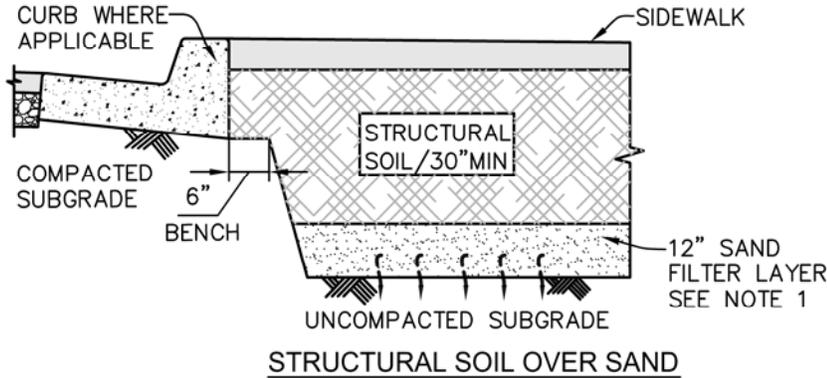
DRAWING NOT TO SCALE

DRAWN BY: <u>M.M.</u>	CHECKED BY: <u>S.W.K.</u>	<b>SAN DIEGO COUNTY DESIGN STANDARD</b>	REVISIONS	APPROVED	DATE
RECOMMENDED BY: <u>STUART W. KUHN, P.E.</u>	APPROVED BY COUNTY ENGINEER				
DATE: _____		<b>TREE WELL WITH OPEN TREE SPACE</b>	<b>DRAWING NUMBER GS-1.4b</b>		
DEYLAMIAN SIROUS, P.E. R.C.E. NO. 53192, EXP 6/30/2017					

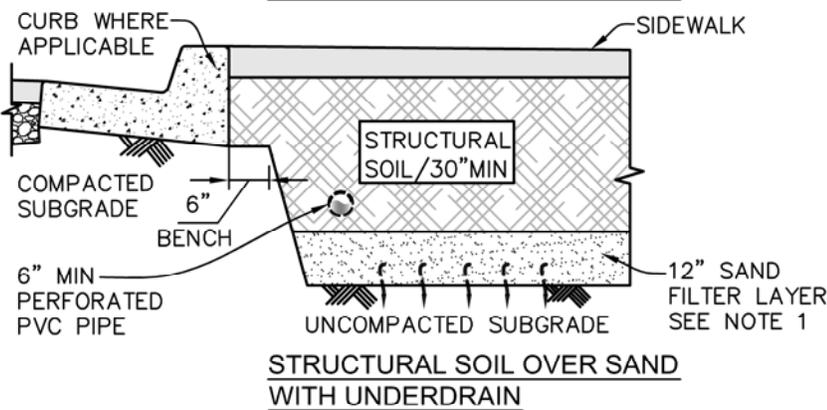
**NOTE: THIS DRAWING IS TO BE INCLUDED ON PLANS UNTIL SIGNED BY THE COUNTY ENGINEER. ONCE SIGNED, IT CAN BE REFERENCED BY NUMBER**



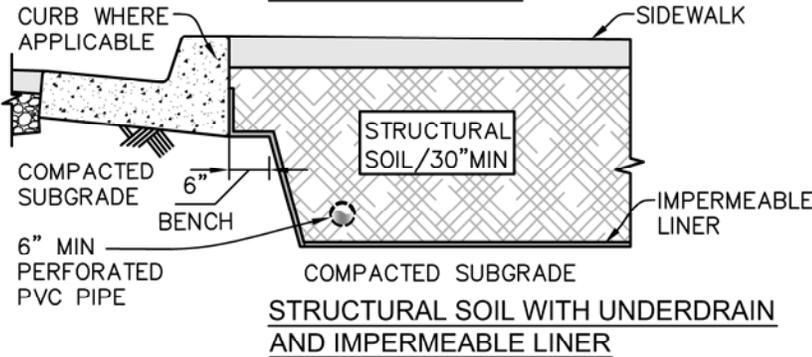
1. IF NRCS HYDROLOGIC SOIL GROUP IS A OR B, OR MEASURED SUBSOIL INFILTRATION RATE IS 0.5 IN/HR OR GREATER, STRUCTURAL SOIL MAY BE PLACED OVER UNCOMPACTED SUBGRADE.



2. IF NRCS HYDROLOGIC SOIL GROUP IS C, OR MEASURED SUBSOIL INFILTRATION RATE IS BETWEEN 0.14 AND 0.5 IN/HR, STRUCTURAL SOIL SHALL BE PLACED OVER 12 IN OF SAND OVER UNCOMPACTED SUBGRADE.



3. IF NRCS HYDROLOGIC SOIL GROUP IS D, OR MEASURED SUBSOIL INFILTRATION RATE IS LESS THAN 0.14 IN/HR, PERFORATED 6" MINIMUM PVC UNDERDRAIN PIPE SHALL BE EMBEDDED IN SAND FILTER OR STRUCTURAL SOIL LAYER AND CONNECTED TO THE STORM DRAINAGE SYSTEM.



4. IF NRCS HYDROLOGIC SOIL GROUP HAS NO SIGNIFICANT INFILTRATION CHARACTERISTICS OR THE SUBGRADE IS CONTAMINATED, PERFORATED 6" MINIMUM PVC UNDERDRAIN PIPE SHALL BE EMBEDDED ON IMPERMEABLE LINER OVER COMPACTED SUBGRADE AND CONNECTED TO THE STORM DRAINAGE SYSTEM.

**NOTES:**

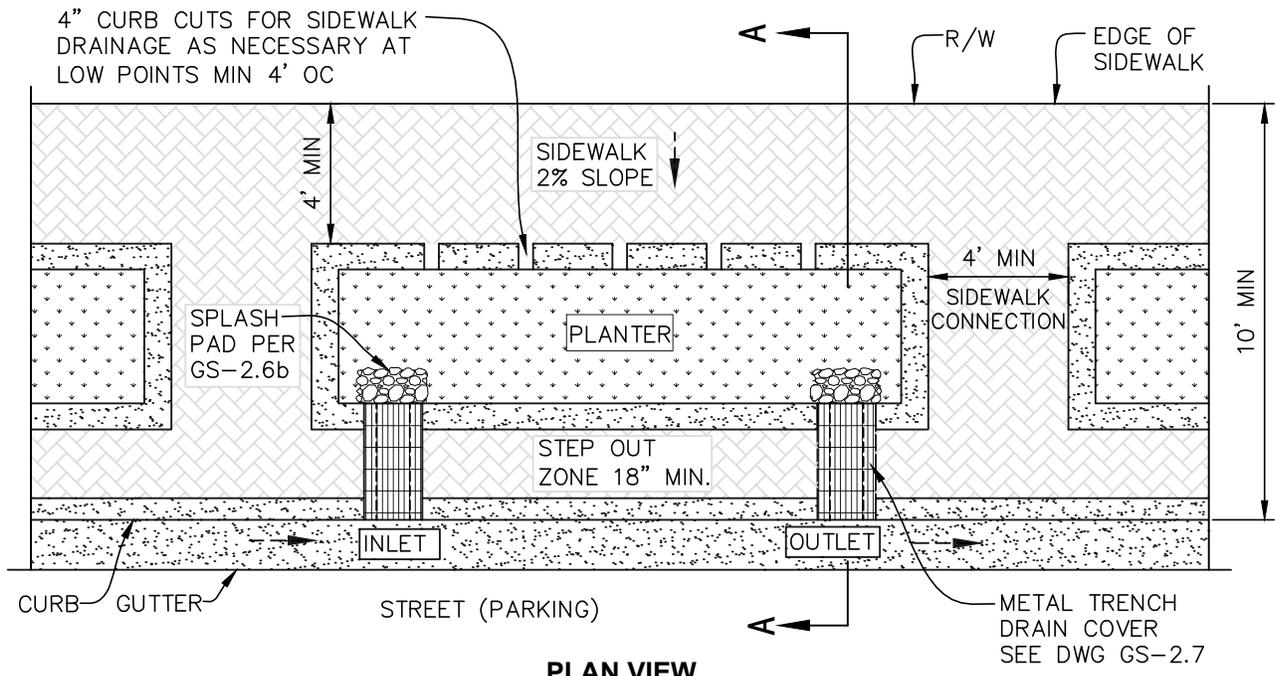
1. SAND SHALL BE PER THE GREEN STREET "ENGINEERED SOIL" SPECIFICATIONS SECTION B-3.

DRAWING NOT TO SCALE

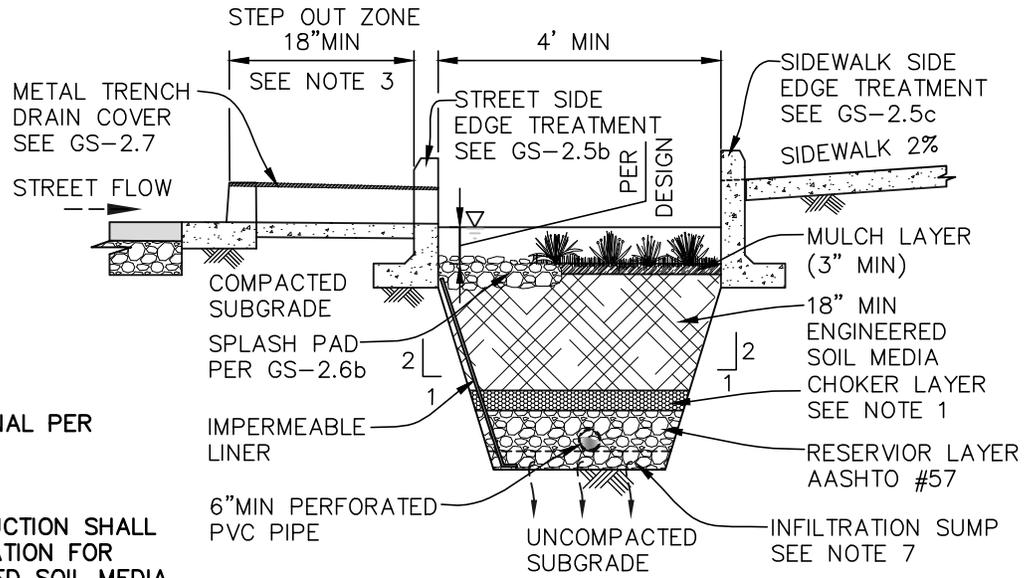
DRAWN BY: <u>M.M.</u>	CHECKED BY: <u>S.W.K.</u>	SAN DIEGO COUNTY DESIGN STANDARD	REVISIONS	APPROVED	DATE
RECOMMENDED BY: <u>STUART W. KUHN, P.E.</u>	APPROVED BY COUNTY ENGINEER				
DATE: _____		<b>TREE WELL WITH STRUCTURAL SOIL SUBSURFACE DRAINAGE OPTIONS</b>	DRAWING NUMBER <b>GS-1.5</b>		
DEYLAMIAN SIROUS, P.E. R.C.E. NO. 53192, EXP 6/30/2017					

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**PLAN VIEW**



**SECTION A-A**

**NOTES:**

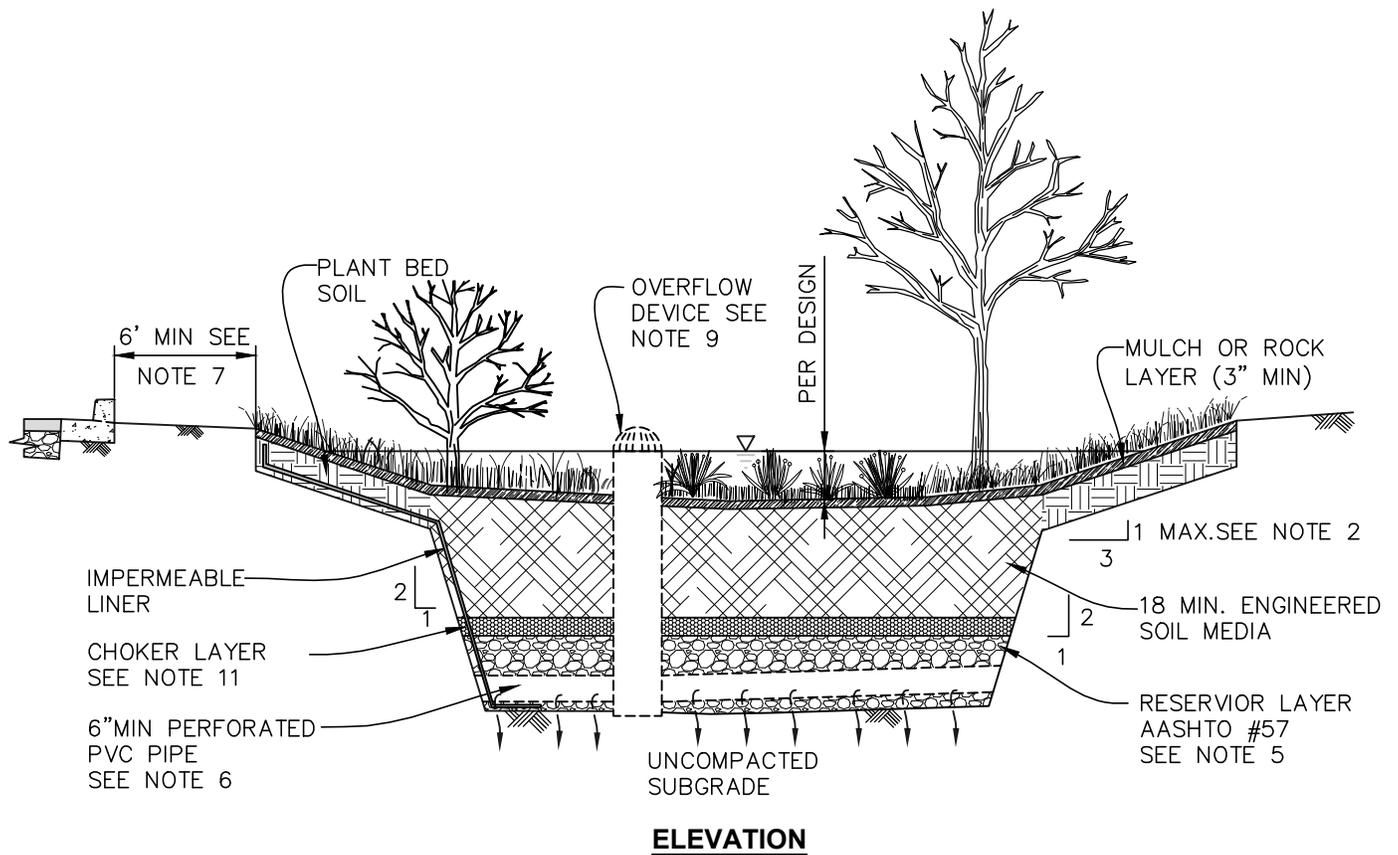
1. CHOKER LAYER IS OPTIONAL PER GEOTECHNICAL ENGINEER RECOMMENDATION.
2. MATERIALS AND CONSTRUCTION SHALL MEET CURRENT SPECIFICATION FOR PLANTING AND ENGINEERED SOIL MEDIA.
3. STEP OUT ZONE REQUIRED WHEN PARALLEL PARKING IS PROVIDED. INSTALLATION MAY BE STANDARD CONCRETE SIDEWALK OR PAVEMENT BASED ON SURROUNDING CONDITIONS.
4. FOR EDGE TREATMENT OPTIONS SEE DWG GS-2.5
5. PLANTINGS SHALL BE INSTALLED IN ACCORDANCE WITH DESIGN PLAN.

6. BOTTOM OF RAIN GARDEN SHALL BE AT LEAST 10' ABOVE THE SEASONAL HIGH WATER TABLE OR 2' ABOVE BEDROCK, AS DETERMINED BY GEOTECHNICAL INVESTIGATION.
7. DEPTH OF INFILTRATION SUMP AS SHOWN ON DESIGN PLANS SHOULD BE SIZED TO ADDRESS STORMWATER MANAGEMENT REQUIREMENTS.
8. OUTLET REQUIRED AS SPECIFIED BY PLANS.

DRAWING NOT TO SCALE

DRAWN BY: _____	CHECKED BY: _____	SAN DIEGO COUNTY DESIGN STANDARD	REVISIONS	APPROVED	DATE
RECOMMENDED BY: JEFF S. MOODY, P.E.					
APPROVED BY COUNTY ENGINEER		<b>RAIN GARDEN PLANTER ADJACENT TO ROADWAY-2 (WITH STEP OUT ZONE)</b>			
DATE: _____					
DEYLAMIAN SIROUS, P.E. R.C.E. NO. 53192, EXP 6/30/2017			DRAWING NUMBER	<b>GS-2.2</b>	

**NOTE: THIS DRAWING IS TO BE INCLUDED ON PLANS UNTIL SIGNED BY THE COUNTY ENGINEER. ONCE SIGNED, IT CAN BE REFERENCED BY NUMBER**



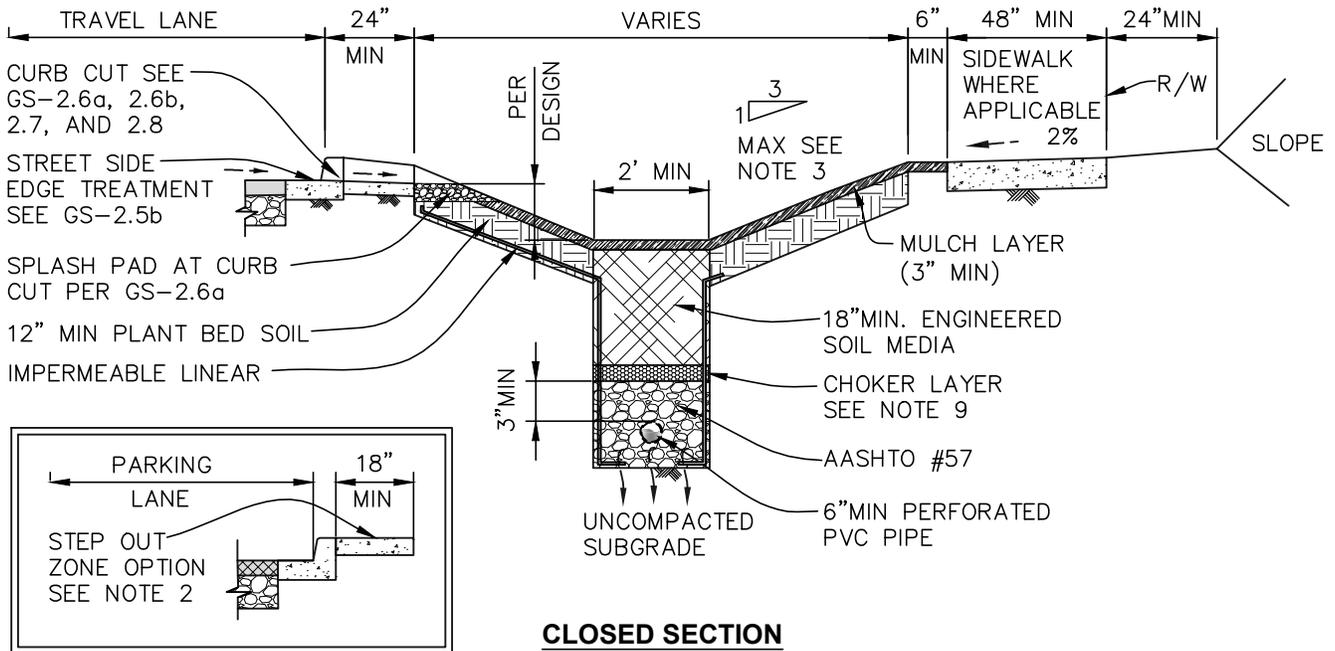
**NOTES:**

1. MATERIALS AND CONSTRUCTION SHALL MEET CURRENT APPROVED COUNTY SPECIFICATION FOR PLANTING AND ENGINEERED SOIL MEDIA.
2. SIDE SLOPES STEEPER THAN 3:1 MAY BE ALLOWED WITH COUNTY APPROVAL.
3. FOR ALTERNATIVE EDGE TREATMENT CONDITIONS, SEE DWG GS-2.5.
4. BOTTOM OF RAIN GARDEN SHALL BE AT LEAST 10' ABOVE THE SEASONAL HIGH WATER TABLE OR 2' ABOVE BEDROCK, AS DETERMINED BY GEOTECHNICAL INVESTIGATION.
5. RESERVOIR LAYER DEPTH SHALL VARY PER DESIGN PLANS, TO ACHIEVE A WATER STORAGE LAYER/ INFILTRATION SUMP WHEN APPLICABLE.
6. PROVIDE UNDERDRAIN WHEN CALLED FOR PER DESIGN PLANS, SEE DWG GS-6.3 FOR MINIMUM BEDDING REQUIREMENT.
7. DISTANCE TO ROADWAY MAY BE REDUCED WHEN THE SIDE IS LINED WITH IMPERMEABLE LINER, PER DESIGN PLANS.
8. SEE GS-6.2 FOR CLEAN OUT AND OBSERVATION WELL DETAIL.
9. RAIN GARDEN FACILITY DEPICTED IS ONE WITH AN OVERFLOW STRUCTURE. "OFF-LINE" FACILITIES DESIGNED TO LIMIT INFLOW SO THAT OVERFLOW STRUCTURES ARE NOT REQUIRED ARE ALSO PERMISSIBLE, AS SHOWN ON DESIGN PLANS; OUTFALL/ OVERFLOW ELEVATION 2" MIN BELOW SIDEWALK.
10. IF DEPTH FROM SURROUNDING GRADE TO LOW POINT OF FACILITY EXCEEDS 5 FEET, A FENCE IS REQUIRED AROUND ENTIRE FACILITY.
11. CHOKER LAYER IS OPTIONAL PER GEOTECHNICAL ENGINEER RECOMMENDATION.

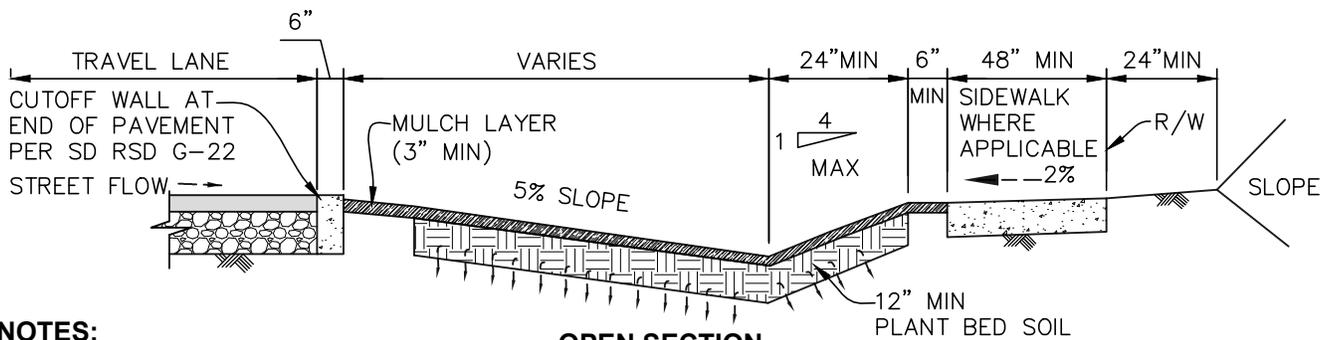
DRAWING NOT TO SCALE

DRAWN BY: _____	CHECKED BY: _____	SAN DIEGO COUNTY DESIGN STANDARD	REVISIONS	APPROVED	DATE
RECOMMENDED BY: JEFF S. MOODY, P.E.					
APPROVED BY COUNTY ENGINEER		<b>RAIN GARDEN IN OPEN AREA</b>			
DATE: _____					
DEYLAMIAN SIROUS, P.E. R.C.E. NO. 53192, EXP 6/30/2017			DRAWING NUMBER	<b>GS-2.3</b>	

**NOTE: THIS DRAWING IS TO BE INCLUDED ON PLANS UNTIL SIGNED BY THE COUNTY ENGINEER. ONCE SIGNED, IT CAN BE REFERENCED BY NUMBER**



**CLOSED SECTION**



**OPEN SECTION**

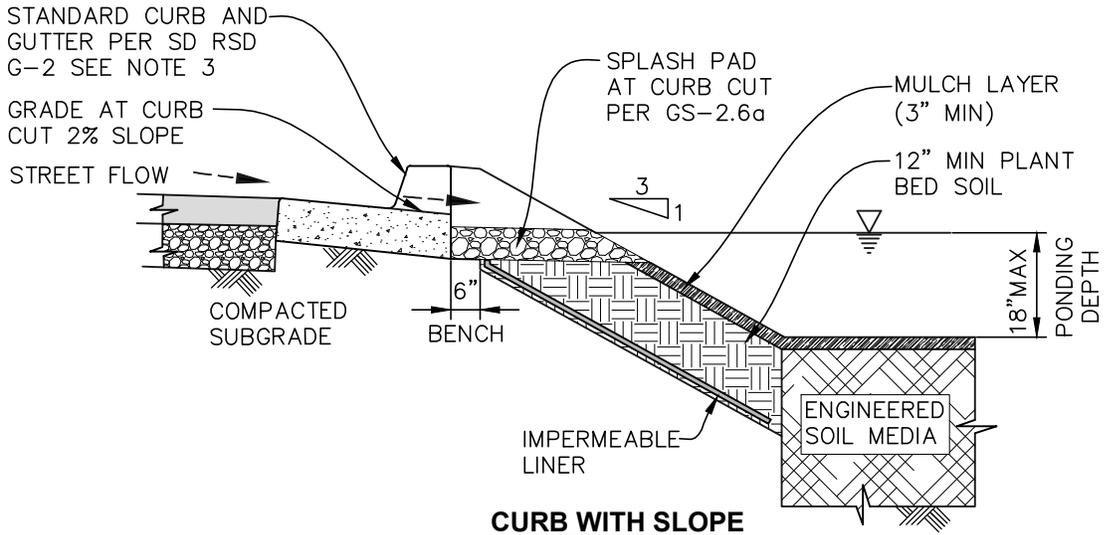
**NOTES:**

1. MATERIALS AND CONSTRUCTION SHALL MEET CURRENT APPROVED COUNTY SPECIFICATION FOR PLANTING AND ENGINEERED SOIL MEDIA.
2. STEP OUT ZONE REQUIRED WHEN PARALLEL PARKING IS PROVIDED. INSTALLATION MAY BE STANDARD CONCRETE SIDEWALK OR PAVEMENT BASED ON SURROUNDING CONDITIONS.
3. SIDE SLOPES STEEPER THAN 3:1 MAY BE ALLOWED WITH COUNTY APPROVAL.
4. TREES AND PLANTS SHALL BE INSTALLED IN ACCORDANCE WITH DESIGN PLANS.
5. BOTTOM OF SWALES SHALL BE AT LEAST 10' ABOVE THE SEASONAL HIGH WATER TABLE OR 2' ABOVE BEDROCK, AS DETERMINED BY GEOTECHNICAL INVESTIGATION.
6. OFFSET TO SWALES MAY BE REDUCED IF ALTERNATIVE EDGE TREATMENT IS USED, SEE DWG GS-2.5
7. DEPTH OF INFILTRATION SUMP AS SHOWN ON DESIGN PLANS SHOULD BE SIZED TO ADDRESS STORMWATER REQUIREMENTS.
8. INSTALL TRAFFIC BARRIER AS NECESSARY BASED ON ROADWAY DESIGN.
9. CHOKER LAYER IS OPTIONAL PER GEOTECHNICAL ENGINEER RECOMMENDATION.

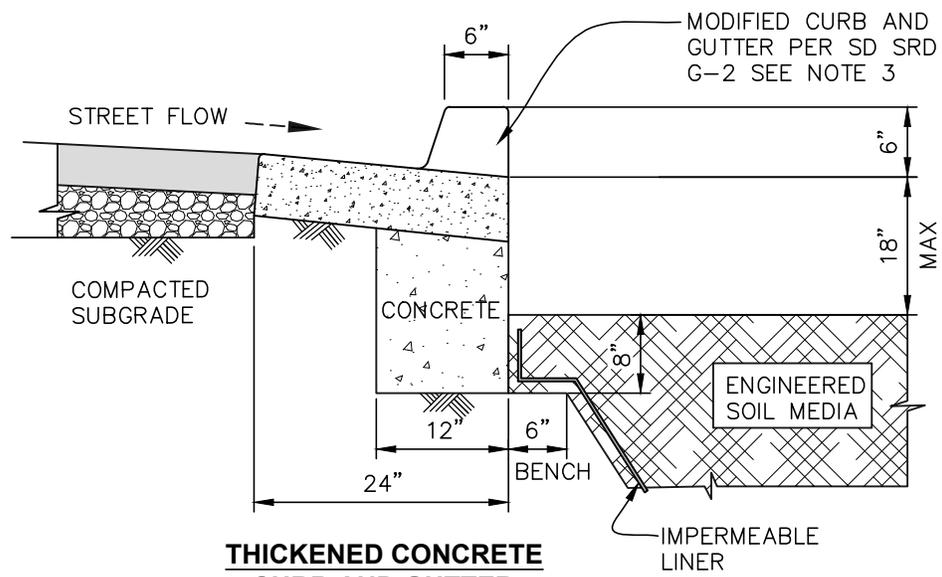
DRAWING NOT TO SCALE

DRAWN BY: _____	CHECKED BY: _____	SAN DIEGO COUNTY DESIGN STANDARD	REVISIONS	APPROVED	DATE
RECOMMENDED BY: JEFF S. MOODY, P.E.					
APPROVED BY COUNTY ENGINEER		<b>SWALES ADJACENT TO ROADWAY</b>			
DATE: _____					
DEYLAMIAN SIROUS, P.E. R.C.E. NO. 53192, EXP 6/30/2017			DRAWING NUMBER	<b>GS-2.4</b>	

**NOTE: THIS DRAWING IS TO BE INCLUDED ON PLANS UNTIL SIGNED BY THE COUNTY ENGINEER. ONCE SIGNED, IT CAN BE REFERENCED BY NUMBER**



**CURB WITH SLOPE**



**THICKENED CONCRETE CURB AND GUTTER**

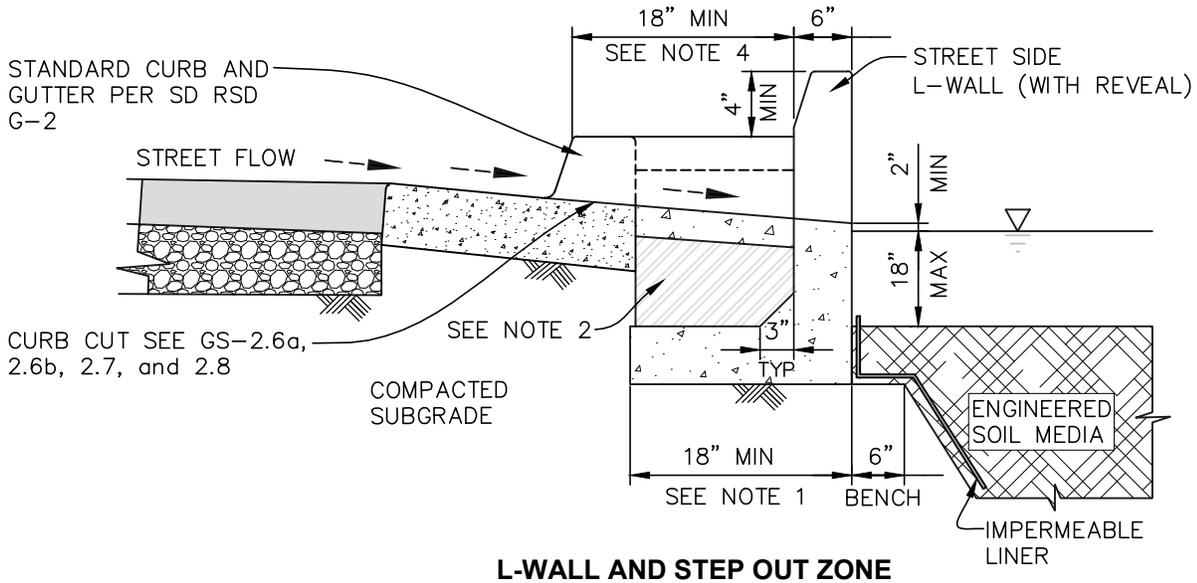
**NOTES:**

1. FINISH ALL EXPOSED CONCRETE SURFACES.
2. CURB TYPE AND MATERIAL TO MATCH PLANS.
3. SLOPE OF GUTTER AND CURB REVEAL TO MATCH STANDARD CURB AND GUTTER PER SD RSD DWG G-2.
4. EXPANSION AND CONTRACTION JOINTS SHALL BE PLACED IN ACCORDANCE WITH STANDARD CONCRETE CURB REQUIREMENTS.
5. PROVIDE AND MAINTAIN A SAFE PEDESTRIAN WALKWAY ACCESS THAT COMPLIES WITH APPLICABLE ADA STANDARDS AND SD SUPPLEMENT TO GREEN BOOK SEC 7-10 "PUBLIC CONVENIENCE AND SAFETY".

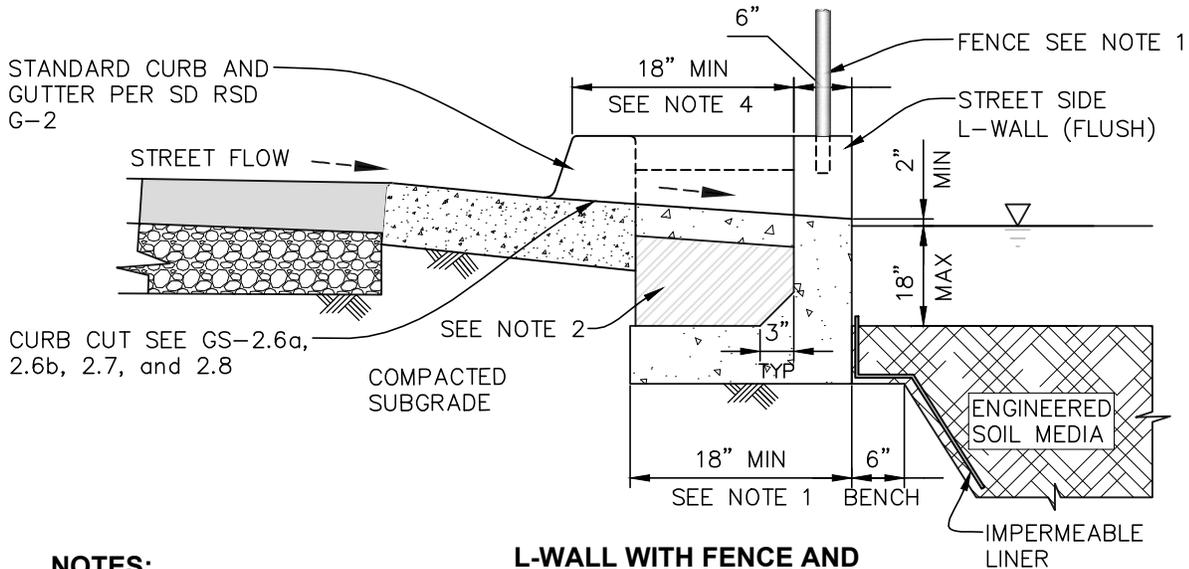
DRAWING NOT TO SCALE

DRAWN BY: _____	CHECKED BY: _____	SAN DIEGO COUNTY DESIGN STANDARD	REVISIONS	APPROVED	DATE
RECOMMENDED BY: JEFF S. MOODY, P.E.					
APPROVED BY COUNTY ENGINEER		<b>STREET SIDE EDGE TREATMENT-1</b>			
DATE: _____					
DEYLAMIAN SIROUS, P.E. R.C.E. NO. 53192, EXP 6/30/2017			(NO STEP OUT ZONE)	DRAWING NUMBER	<b>GS-2.5a</b>

**NOTE: THIS DRAWING IS TO BE INCLUDED ON PLANS UNTIL SIGNED BY THE COUNTY ENGINEER. ONCE SIGNED, IT CAN BE REFERENCED BY NUMBER**



**L-WALL AND STEP OUT ZONE**



**L-WALL WITH FENCE AND STEP OUT ZONE**

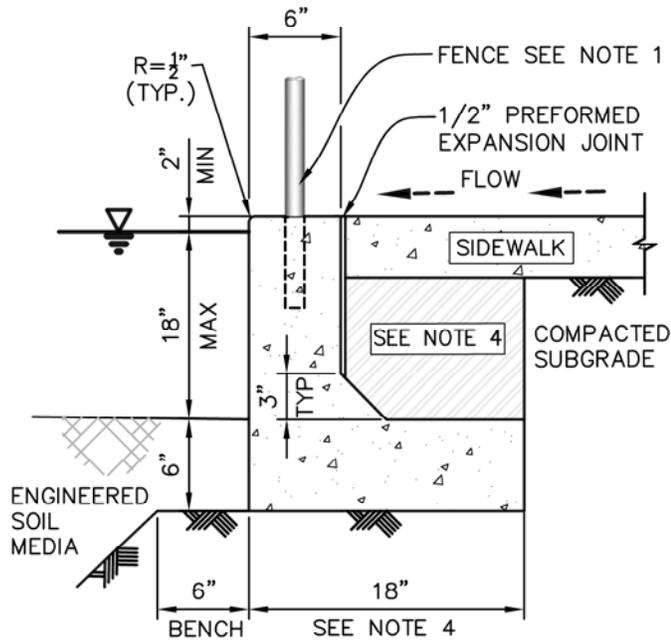
**NOTES:**

1. WHEN FLUSH WALLS ARE SELECTED, TYPICALLY IN HIGH-VOLUME PEDESTRIAN AREAS, PROVIDE RAILING OR FENCE PER PLAN.
2. 18" BASE WIDTH MAY BE REDUCED TO 15" IF CONCRETE IS USED IN THE HATCHED AREA.
3. FINISH ALL EXPOSED CONCRETE SURFACES.
4. STEP OUT ZONE INSTALLATION MAY BE STANDARD CONCRETE SIDEWALK OR OTHER PAVEMENT AS SHOWN ON PLANS.
5. EXPANSION JOINTS SHALL BE PLACED AT MAXIMUM 90 FOOT INTERVAL. CONTRACTION JOINTS SHALL BE FORMED OR SAWED AT 30 FOOT MAXIMUM INTERVALS BETWEEN EXPANSION JOINTS. WHERE ADJACENT TO CURB, SIDEWALK OR CONCRETE PAVEMENT, JOINTS SHALL LINE UP.

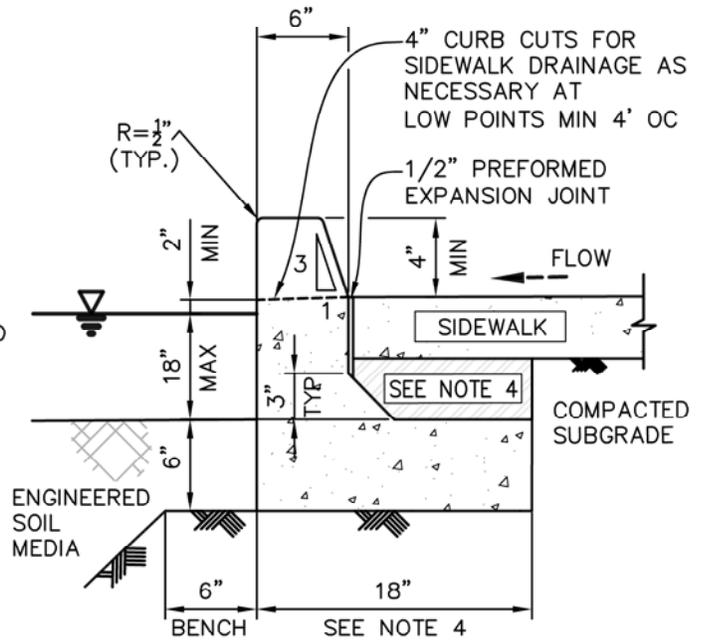
DRAWING NOT TO SCALE

DRAWN BY: _____	CHECKED BY: _____	SAN DIEGO COUNTY DESIGN STANDARD	REVISIONS	APPROVED	DATE
RECOMMENDED BY: JEFF S. MOODY, P.E.					
APPROVED BY COUNTY ENGINEER		<b>STREET SIDE EDGE TREATMENT-2</b>			
DATE: _____					
DEYLAMIAN SIROUS, P.E. R.C.E. NO. 53192, EXP 6/30/2017		(WITH STEP OUT ZONE)	DRAWING NUMBER	<b>GS-2.5b</b>	

**NOTE: THIS DRAWING IS TO BE INCLUDED ON PLANS UNTIL SIGNED BY THE COUNTY ENGINEER. ONCE SIGNED, IT CAN BE REFERENCED BY NUMBER**



**WITH PEDESTRIAN FENCE**



**WITH CURB**

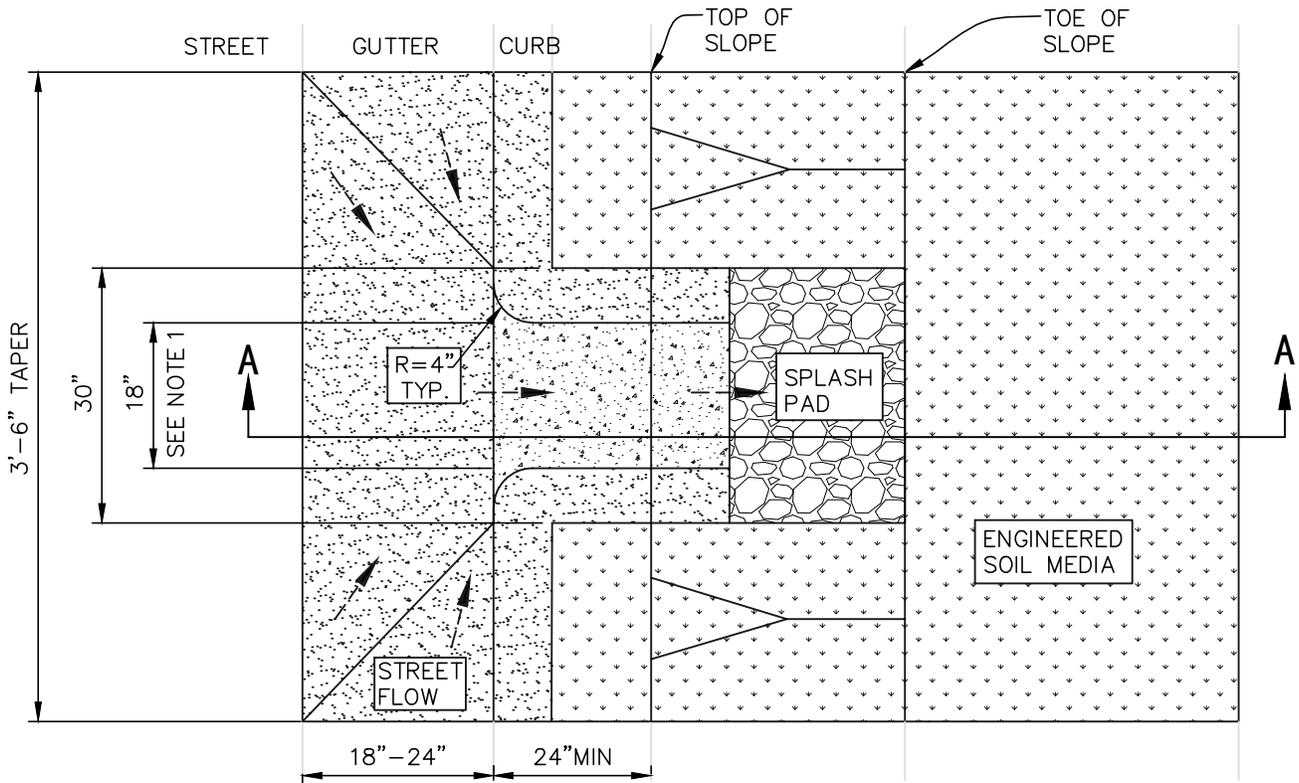
**NOTES:**

1. WHEN FLUSH WALLS ARE SELECTED, TYPICALLY IN HIGH-VOLUME PEDESTRIAN AREAS, PROVIDE RAILING OR FENCE PER PLAN. FENCE TYPE, STYLE, AND FINISH TO BE APPROVED BY LOCAL PLANNING AUTHORITY.
2. WHEN WALLS WITH REVEALS ARE USED, TYPICALLY IN LOW-VOLUME PEDESTRIAN AREA, PROVIDE BREAKS IN REVEAL AS SHOWN ON PLANS TO ALLOW FOR SIDEWALK RUNOFF INTO STORMWATER MANAGEMENT FACILITY.
3. FINISH ALL EXPOSED CONCRETE SURFACES.
4. BASE WIDTH MAY BE REDUCED TO 15" IF CONCRETE IS USED IN THE HATCHED AREA.
5. EXPANSION JOINTS SHALL BE PLACED AT MAXIMUM 90 FOOT INTERVAL. CONTRACTION JOINTS SHALL BE FORMED OR SAWED AT 30 FOOT MAXIMUM INTERVALS BETWEEN EXPANSION JOINTS. WHERE ADJACENT TO CURB, SIDEWALK OR CONCRETE PAVEMENT, JOINTS SHALL LINE UP.

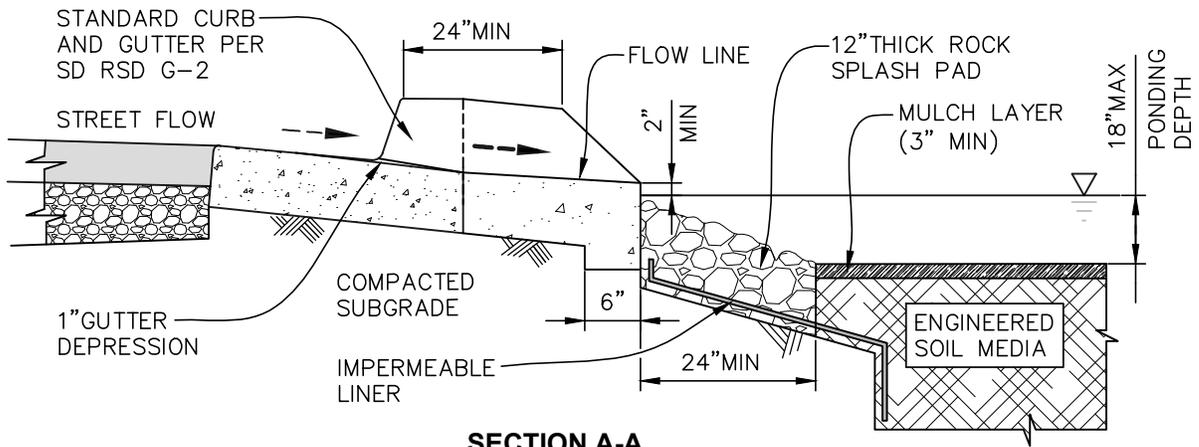
DRAWING NOT TO SCALE

DRAWN BY: <u>M.M.</u>	CHECKED BY: <u>S.W.K.</u>	SAN DIEGO COUNTY DESIGN STANDARD	REVISIONS	APPROVED	DATE
RECOMMENDED BY: <u>STUART W. KUHN, P.E.</u>	APPROVED BY COUNTY ENGINEER				
DATE: _____		<b>SIDEWALK SIDE EDGE TREATMENT</b>	DRAWING NUMBER <b>GS-2.5c</b>		
SIROUS DEYLAMIAN, P.E. R.C.E. NO. 53192, EXP 6/30/2017					

**NOTE: THIS DRAWING IS TO BE INCLUDED ON PLANS UNTIL SIGNED BY THE COUNTY ENGINEER. ONCE SIGNED, IT CAN BE REFERENCED BY NUMBER**



**CONCRETE FLUME WITH WINGWALLS  
AND ROCK SPLASH PAD**



**SECTION A-A**

**NOTES:**

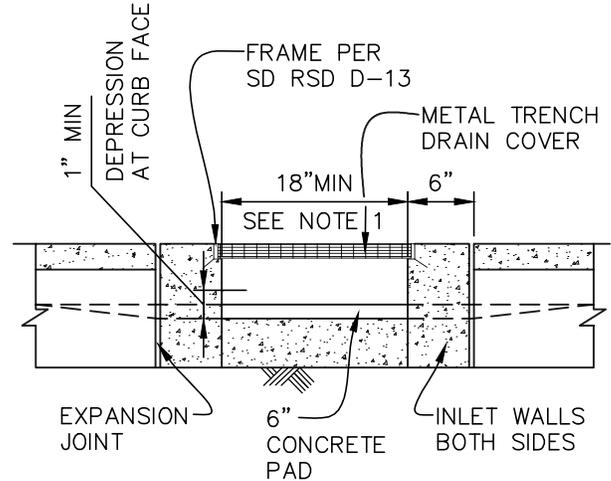
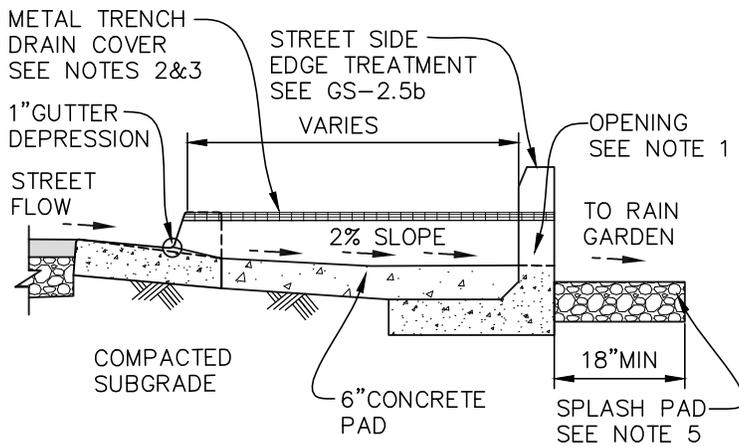
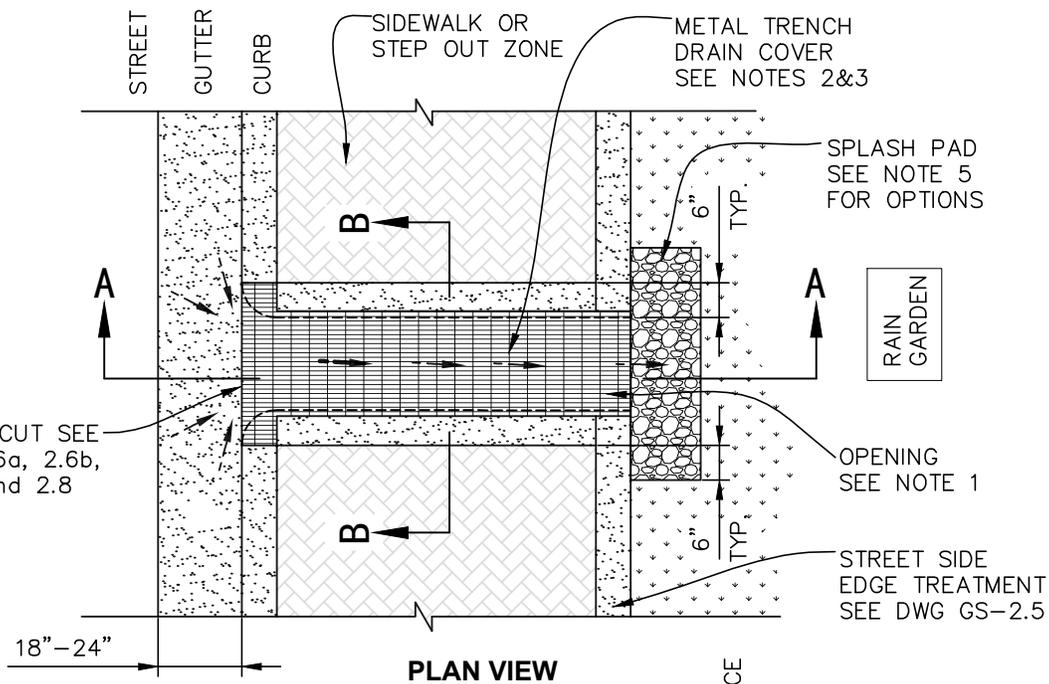
1. CURB OPENING DIMENSION SHOWN IS A MINIMUM. CURB CUT SHALL BE SIZED TO CONVEY 85TH PERCENTILE RAINFALL.
2. SEE DWG GS-2.8 FOR METAL TRENCH DRAIN COVER CURB CUT.
3. SIDE SLOPES STEEPER THAN 3:1 MAY BE ALLOWED WITH COUNTY APPROVAL.

DRAWING NOT TO SCALE

DRAWN BY: _____	CHECKED BY: _____	SAN DIEGO COUNTY DESIGN STANDARD	REVISIONS	APPROVED	DATE
RECOMMENDED BY: JEFF S. MOODY, P.E.					
APPROVED BY COUNTY ENGINEER		<b>CURB CUT WITH SPLASH PAD - 1</b>			
DATE: _____					
DEYLAMIAN SIROUS, P.E. R.C.E. NO. 53192, EXP 6/30/2017			DRAWING NUMBER <b>GS-2.6a</b>		

**NOTE: THIS DRAWING IS TO BE INCLUDED ON PLANS UNTIL SIGNED BY THE COUNTY ENGINEER. ONCE SIGNED, IT CAN BE REFERENCED BY NUMBER**





**SECTION A-A**

**SECTION B-B**

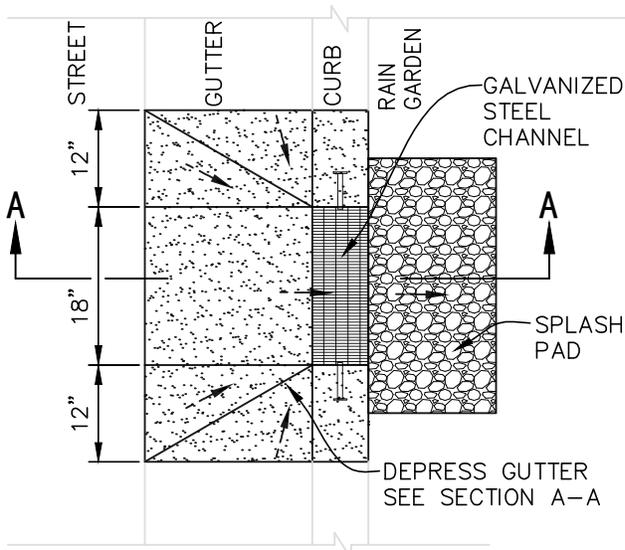
**NOTES:**

1. CURB OPENING DIMENSION SHOWN IS 18" MINIMUM. CURB CUT SHALL BE SIZED TO CONVEY 85TH PERCENTILE RAINFALL.
2. PROVIDE AND MAINTAIN A SAFE PEDESTRIAN WALKWAY ACCESS THAT COMPLIES WITH APPLICABLE ADA STANDARDS AND SD SUPPLEMENT TO GREEN BOOK SEC 7-10 "PUBLIC CONVENIENCE AND SAFETY".
3. REFER TO DESIGN PLANS FOR SIZE AND TYPE OF COVER.
4. METAL TRENCH DRAIN COVER TO BE BOLTED DOWN (THEFT PROTECTED) BUT REMOVABLE.
5. SPLASH PAD DEPTH OPTIONS: 12" STONE #2, 4" CONCRETE SLAB, OR PAVER BLOCKS ON 6" AGGREGATE AASHTO #57.

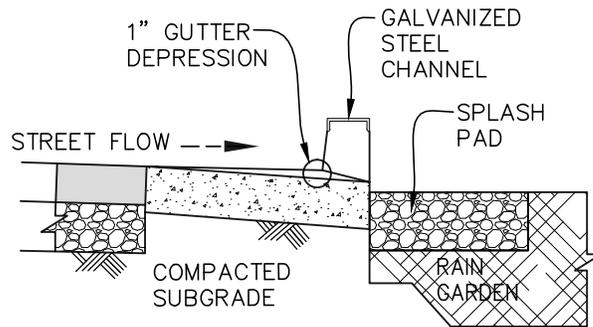
DRAWING NOT TO SCALE

DRAWN BY: _____	CHECKED BY: _____	SAN DIEGO COUNTY DESIGN STANDARD	REVISIONS	APPROVED	DATE
RECOMMENDED BY: JEFF S. MOODY, P.E.					
APPROVED BY COUNTY ENGINEER		<b>CURB CUT METAL TRENCH COVER</b>			
DATE: _____					
DEYLAMIAN SIROUS, P.E. R.C.E. NO. 53192, EXP 6/30/2017			DRAWING NUMBER	<b>GS-2.7</b>	

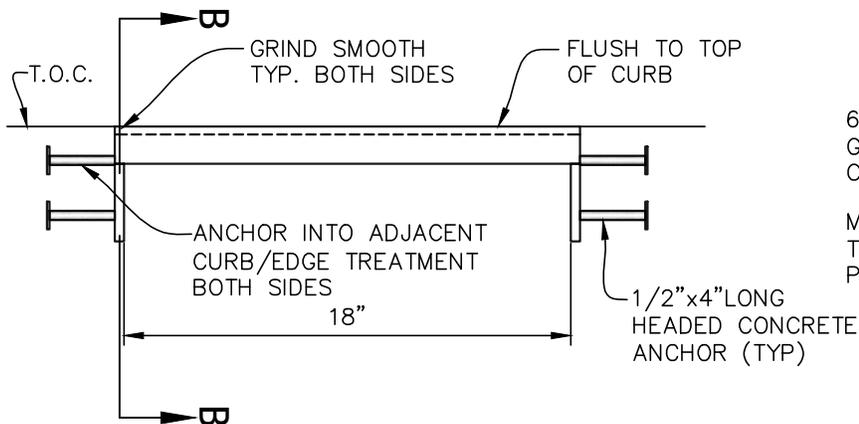
**NOTE: THIS DRAWING IS TO BE INCLUDED ON PLANS UNTIL SIGNED BY THE COUNTY ENGINEER. ONCE SIGNED, IT CAN BE REFERENCED BY NUMBER**



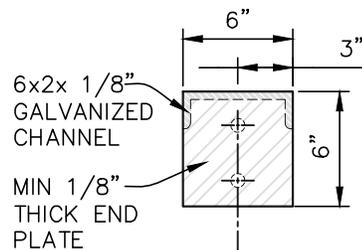
**PLAN VIEW**



**SECTION A-A**



**ELEVATION**



**SECTION B-B**

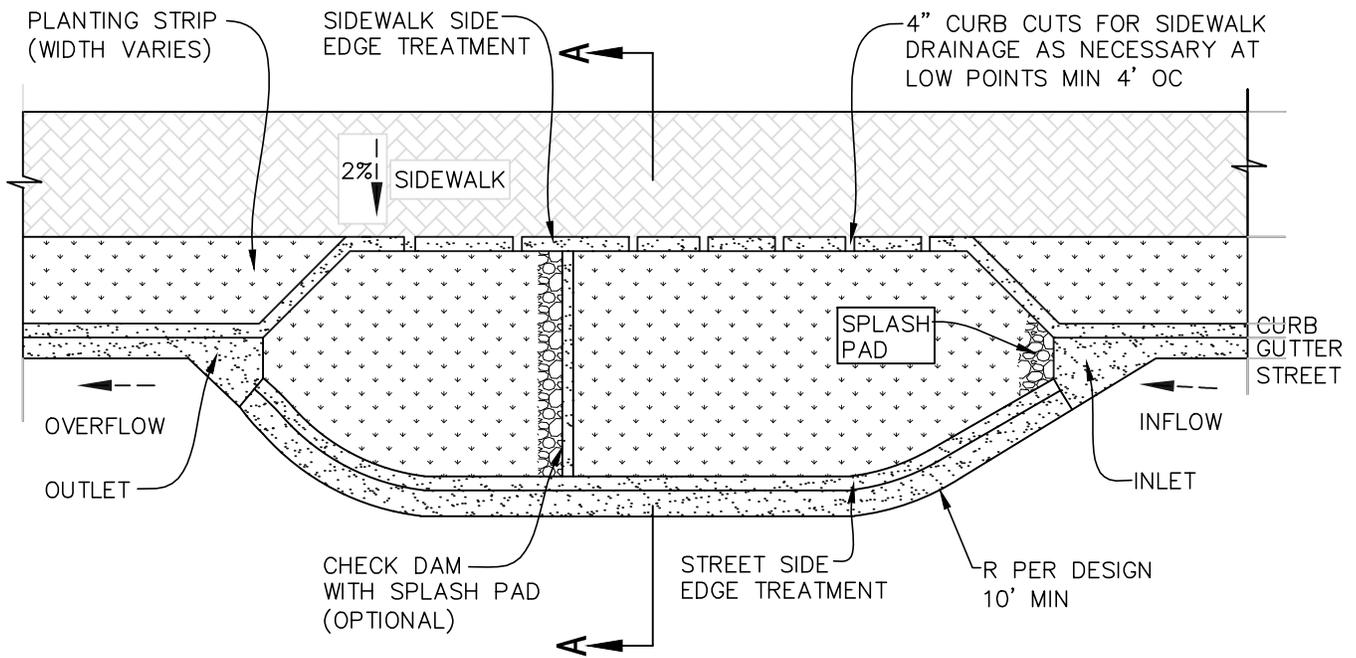
**NOTES:**

1. METAL COVER OVER CURB CUT MAY BE OMITTED WITH COUNTY APPROVAL.
2. ENTIRE ASSEMBLY SHALL BE HOT DIP GALVANIZED STEEL IN ACCORDANCE WITH ASTM A-123.
3. SHARP POINTS, CORNERS AND EDGES OF METAL COVER SHALL BE POLISHED SMOOTH.
4. SINGLE BEVEL GROOVE WELD.
5. DESIGN VERTICAL WHEEL LOAD IS 8.5 KIPS ONE HALF OF TANDEM AXLE WEIGHT SPECIFIED IN FHWA HOP-06-105).
6. ALTERNATE MATERIAL FOR ASSEMBLY MAY BE USED PER COUNTY APPROVAL.

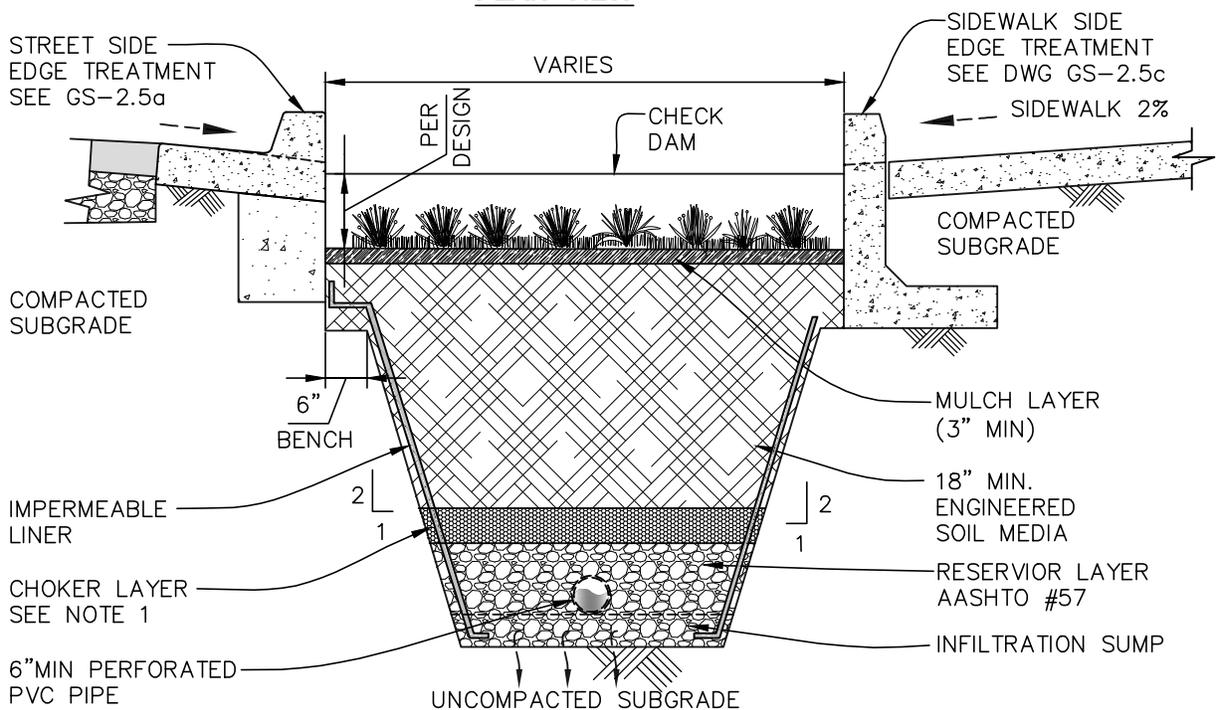
DRAWING NOT TO SCALE

DRAWN BY: _____	CHECKED BY: _____	SAN DIEGO COUNTY DESIGN STANDARD	REVISIONS	APPROVED	DATE
RECOMMENDED BY: JEFF S. MOODY, P.E.					
APPROVED BY COUNTY ENGINEER		<b>GALVANIZED STEEL CHANNEL OVER CURB CUT</b>			
DATE: _____					
DEYLAMIAN SIROUS, P.E. R.C.E. NO. 53192, EXP 6/30/2017			DRAWING NUMBER <b>GS-2.8</b>		

**NOTE: THIS DRAWING IS TO BE INCLUDED ON PLANS UNTIL SIGNED BY THE COUNTY ENGINEER. ONCE SIGNED, IT CAN BE REFERENCED BY NUMBER**



**IN-PLANTING STRIP  
PLAN VIEW**



**SECTION A-A  
(WALL OPTION)**

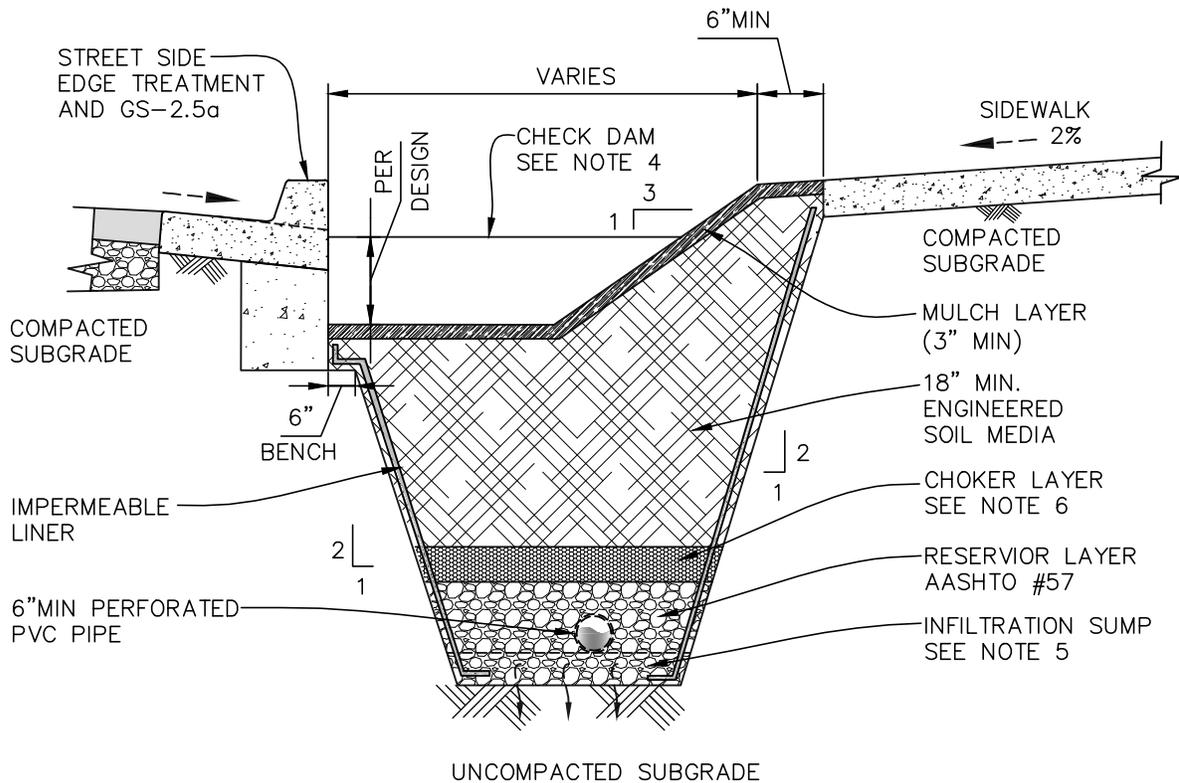
**NOTES:**

1. CHOKER LAYER IS OPTIONAL PER GEOTECHNICAL ENGINEER RECOMMENDATION.

DRAWING NOT TO SCALE

DRAWN BY: _____	CHECKED BY: _____	SAN DIEGO COUNTY DESIGN STANDARD	REVISIONS	APPROVED	DATE
RECOMMENDED BY: JEFF S. MOODY, P.E.					
APPROVED BY COUNTY ENGINEER		<b>CURB EXTENSION ADJACENT TO PLANTING STRIP</b>			
DATE: _____					
DEYLAMIAN SIROUS, P.E. R.C.E. NO. 53192, EXP 6/30/2017			DRAWING NUMBER <b>GS-3.1a</b>		

**NOTE: THIS DRAWING IS TO BE INCLUDED ON PLANS UNTIL SIGNED BY THE COUNTY ENGINEER. ONCE SIGNED, IT CAN BE REFERENCED BY NUMBER**



**SECTION A-A  
(SLOPE OPTION)**

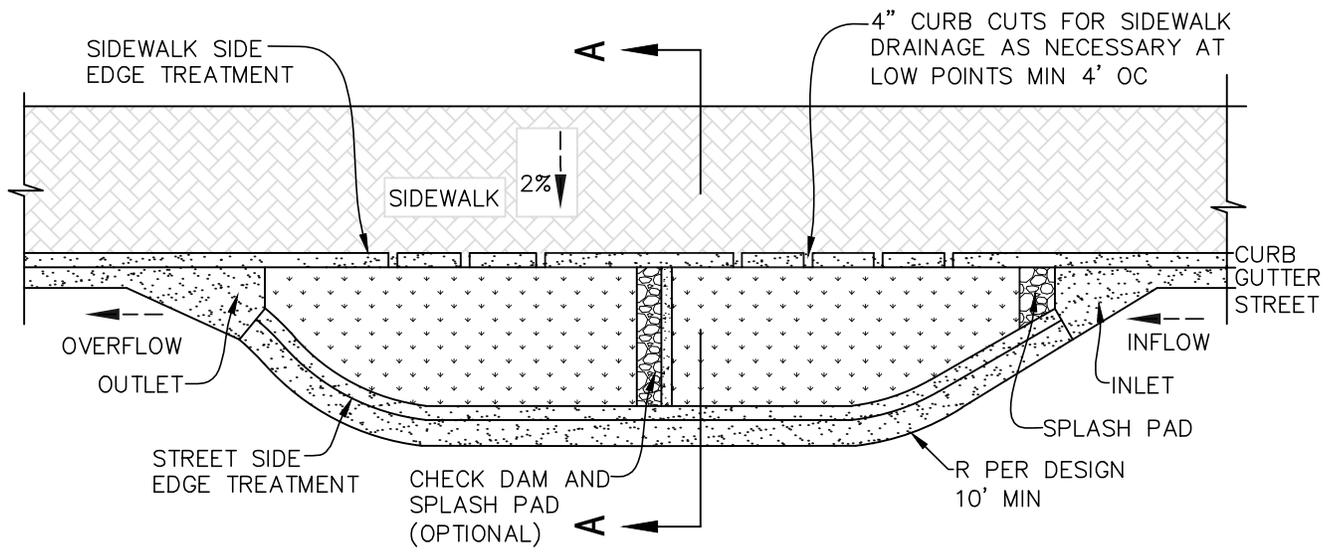
**NOTES:**

1. LONGITUDINAL SLOPE OF PLANTER MATCHES ROAD OR FLATTER AS REQUIRED PER DESIGN PLANS.
2. SIDEWALK ELEVATION MUST BE SET ABOVE INLET AND OUTLET ELEVATIONS TO ALLOW OVERFLOW TO DRAIN TO STREET BEFORE PONDING LEVEL REACHES SIDEWALK.
3. SEE DWG GS-3.2c FOR INLET AND OUTLET DETAILS.
4. CHECK DAMS REQUIRED AS PER DESIGN PLANS SEE DWG GS-4.1 THRU GS-4.3
5. DEPTH OF INFILTRATION SUMP AS SHOWN ON DESIGN PLANS SHOULD BE SIZED TO ADDRESS STORMWATER MANAGEMENT REQUIREMENTS.
6. CHOKER LAYER IS OPTIONAL PER GEOTECHNICAL ENGINEER RECOMMENDATION.

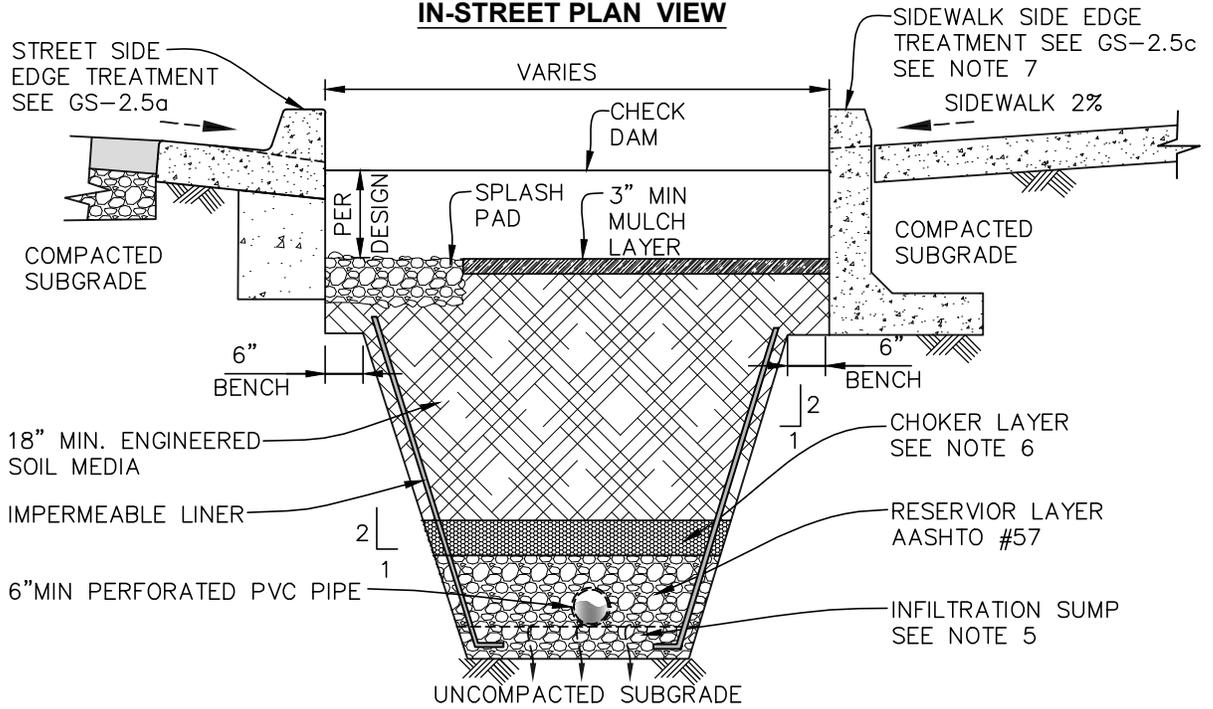
DRAWING NOT TO SCALE

DRAWN BY: _____	CHECKED BY: _____	SAN DIEGO COUNTY DESIGN STANDARD	REVISIONS	APPROVED	DATE
RECOMMENDED BY: JEFF S. MOODY, P.E.					
APPROVED BY COUNTY ENGINEER		<b>CURB EXTENSION ADJACENT TO PLANTING STRIP</b>			
DATE: _____					
DEYLAMIAN SIROUS, P.E. R.C.E. NO. 53192, EXP 6/30/2017			DRAWING NUMBER	<b>GS-3.1b</b>	

**NOTE: THIS DRAWING IS TO BE INCLUDED ON PLANS UNTIL SIGNED BY THE COUNTY ENGINEER. ONCE SIGNED, IT CAN BE REFERENCED BY NUMBER**



**IN-STREET PLAN VIEW**



**SECTION A-A**

**NOTES:**

1. LONGITUDINAL SLOPE OF PLANTER MATCHES ROAD OR FLATTER AS REQUIRED PER DESIGN PLANS.
2. SIDEWALK ELEVATION MUST BE SET ABOVE INLET AND OUTLET ELEVATIONS TO ALLOW OVERFLOW TO DRAIN TO STREET BEFORE PONDING LEVEL REACHES SIDEWALK.
3. SEE GS-3.3 FOR INLET AND OUTLET DETAILS.
4. CHECK DAMS REQUIRED AS PER DESIGN PLANS SEE S-4.1a, 4.1b, 4.2a, AND 4.2b.
5. DEPTH OF INFILTRATION SUMP AS SHOWN ON DESIGN PLANS SHOULD BE SIZED TO ADDRESS STORMWATER MANAGEMENT REQUIREMENTS.
6. CHOKER LAYER IS OPTIONAL PER GEOTECHNICAL ENGINEER RECOMMENDATION.
7. A 3 TO 1 SLOPE MAY BE USED IN LIEU OF THE L-WALL WHERE ADEQUATE SPACE IS AVAILABLE SEE GS-3.1b.

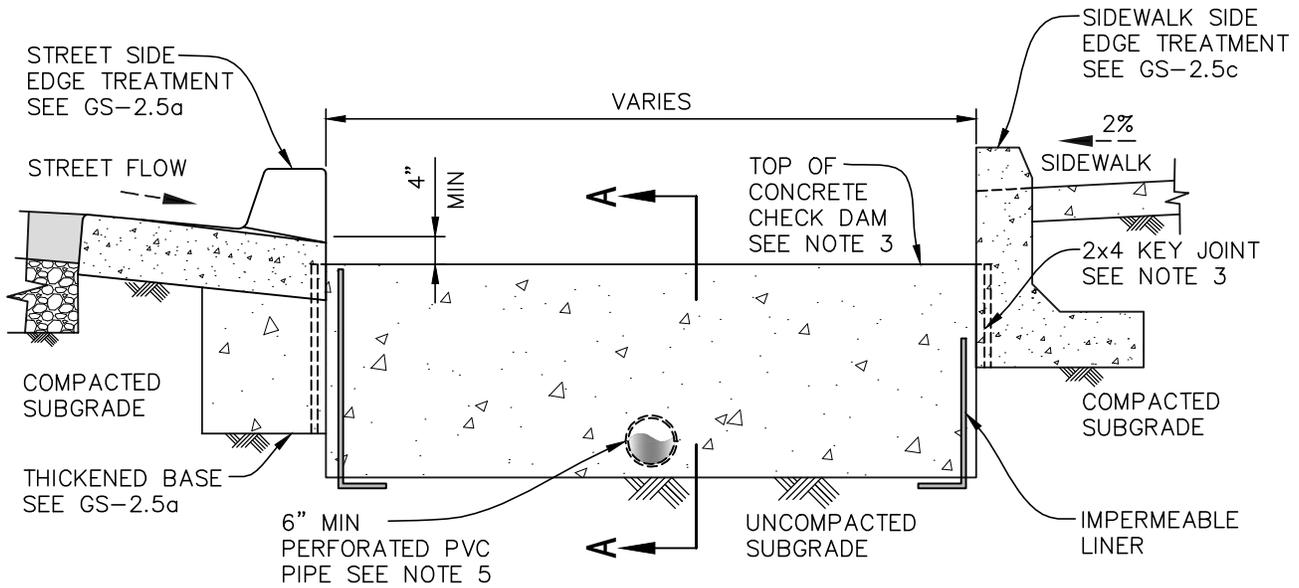
DRAWING NOT TO SCALE

DRAWN BY: _____	CHECKED BY: _____	SAN DIEGO COUNTY DESIGN STANDARD	REVISIONS	APPROVED	DATE
RECOMMENDED BY: JEFF S. MOODY, P.E.					
APPROVED BY COUNTY ENGINEER		<b>CURB EXTENSION ADJACENT TO SIDEWALK</b>			
DATE: _____					
DEYLAMIAN SIROUS, P.E. R.C.E. NO. 53192, EXP 6/30/2017			DRAWING NUMBER	<b>GS-3.2</b>	

**NOTE: THIS DRAWING IS TO BE INCLUDED ON PLANS UNTIL SIGNED BY THE COUNTY ENGINEER. ONCE SIGNED, IT CAN BE REFERENCED BY NUMBER**







**SECTION B-B**

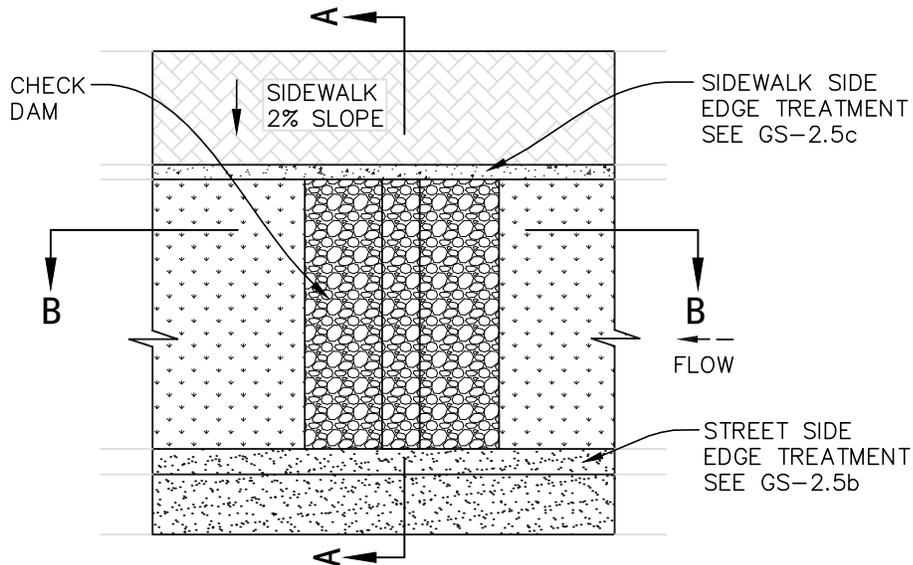
**NOTES:**

1. LOCATION, HEIGHT, AND WIDTH OF CHECK DAMS TO BE SPECIFIED IN THE DESIGN PLANS.
2. CONCRETE CHECK DAM SHALL BE CONTINUOUS (NO JOINTS).
3. TO INSURE PROPER BONDING BETWEEN THE CHECK DAM AND THE EDGE TREATMENT, A 2x4 KEY JOINT SHALL BE FORMED ON BOTH SIDES PER SD RSD C-7.
4. DEPTH OF CHECK DAM VARIES DEPENDING ON THE DEPTH OF THE FACILITY.
5. IF PRESENT, UNDERDRAIN TO PASS THROUGH CHECK DAM IN A NON-PERFORATED PVC PIPE.
6. FOR EDGE TREATMENT OPTIONS SEE DWG GS-2.5a, GS-2.5b, AND 2.5c.
7. EXCLUDE EDGE TREATMENT OPENING WHEN THE TOP OF SIDEWALK ELEVATION IS FLUSH WITH THE TOP OF EDGE TREATMENT WALL SEE DRAWING GS-2.5c.

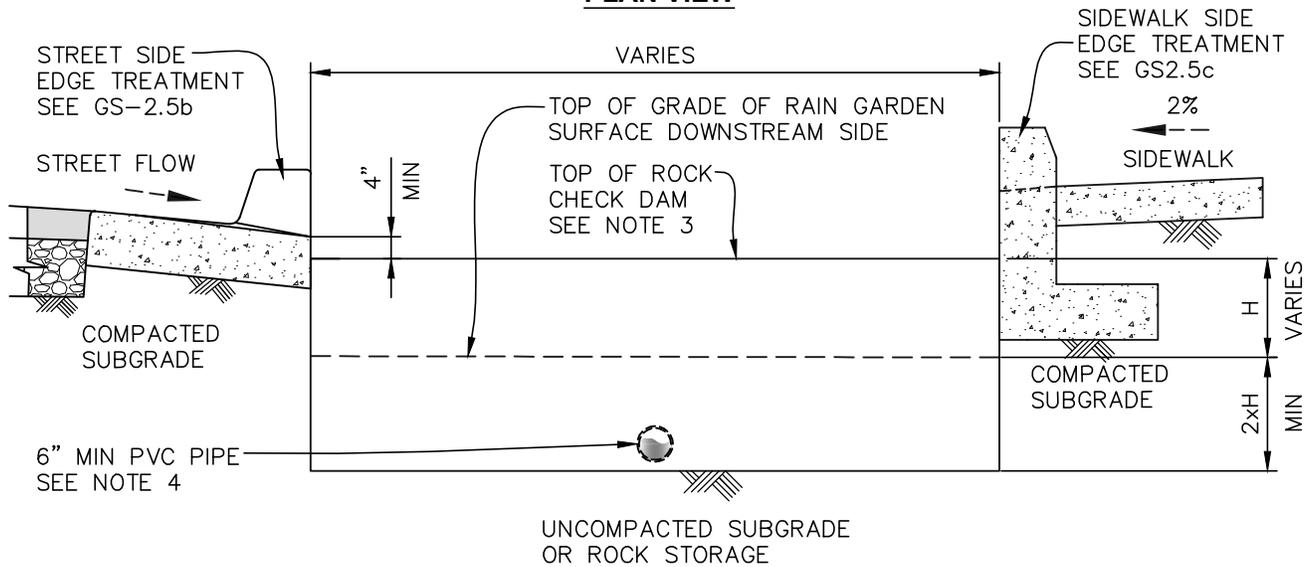
DRAWING NOT TO SCALE

DRAWN BY: _____ CHECKED BY: _____ RECOMMENDED BY: JEFF S. MOODY, P.E. APPROVED BY COUNTY ENGINEER _____ DATE: _____ DEYLAMIAN SIROUS, P.E. R.C.E. NO. 53192, EXP 6/30/2017	SAN DIEGO COUNTY DESIGN STANDARD  <b>CONCRETE CHECK DAM</b>	REVISIONS APPROVED DATE
		DRAWING NUMBER <b>GS-4.1b</b>

**NOTE: THIS DRAWING IS TO BE INCLUDED ON PLANS UNTIL SIGNED BY THE COUNTY ENGINEER. ONCE SIGNED, IT CAN BE REFERENCED BY NUMBER**



**PLAN VIEW**



**SECTION A-A**

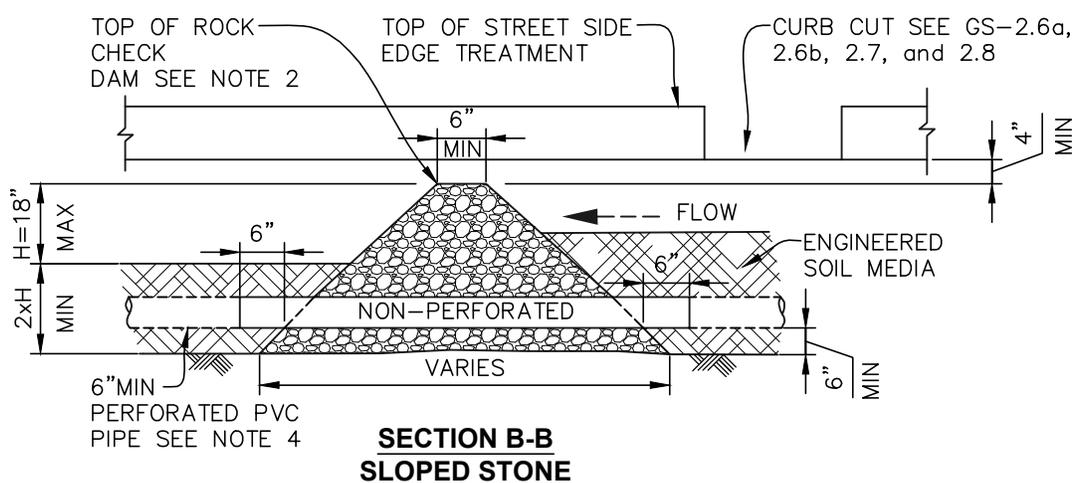
**NOTES:**

1. LOCATION, HEIGHTS, AND WIDTH OF CHECK DAMS TO BE SPECIFIED IN THE DESIGN PLANS.
2. SIZE OF STONE OR AGGREGATE TO BE SPECIFIED IN THE DESIGN PLANS.
3. DEPTH OF CHECK DAM VARIES DEPENDING ON THE DEPTH OF THE FACILITY.
4. IF PRESENT, UNDERDRAIN TO PASS THROUGH CHECK DAM IN A NON-PERFORATED PVC PIPE
5. FOR EDGE TREATMENT OPTIONS SEE DWG GS-2.5a, GS-2.5b, AND GS-2.5c
6. PROVIDE GABION BASKET, WELDED MESH TYPE WHEN UNDERDRAIN IS USED, TIE ALL WIRE BASKETS TOGETHER TO CREATE A CONTINUOUS STRUCTURE ALONG ITS LENGTH.

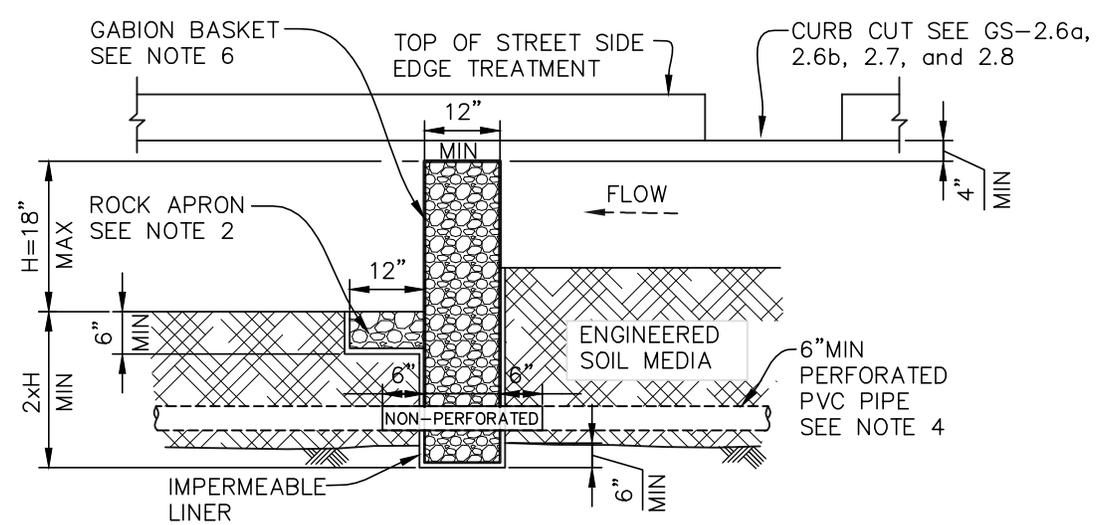
DRAWING NOT TO SCALE

DRAWN BY: _____	CHECKED BY: _____	SAN DIEGO COUNTY DESIGN STANDARD	REVISIONS	APPROVED	DATE
RECOMMENDED BY: JEFF S. MOODY, P.E.					
APPROVED BY COUNTY ENGINEER		<b>ROCK CHECK DAM</b>			
DATE: _____					
DEYLAMIAN SIROUS, P.E. R.C.E. NO. 53192, EXP 6/30/2017			DRAWING NUMBER	<b>GS-4.2a</b>	

**NOTE: THIS DRAWING IS TO BE INCLUDED ON PLANS UNTIL SIGNED BY THE COUNTY ENGINEER. ONCE SIGNED, IT CAN BE REFERENCED BY NUMBER**



**SECTION B-B  
SLOPED STONE**



**SECTION B-B  
GABION BASKET**

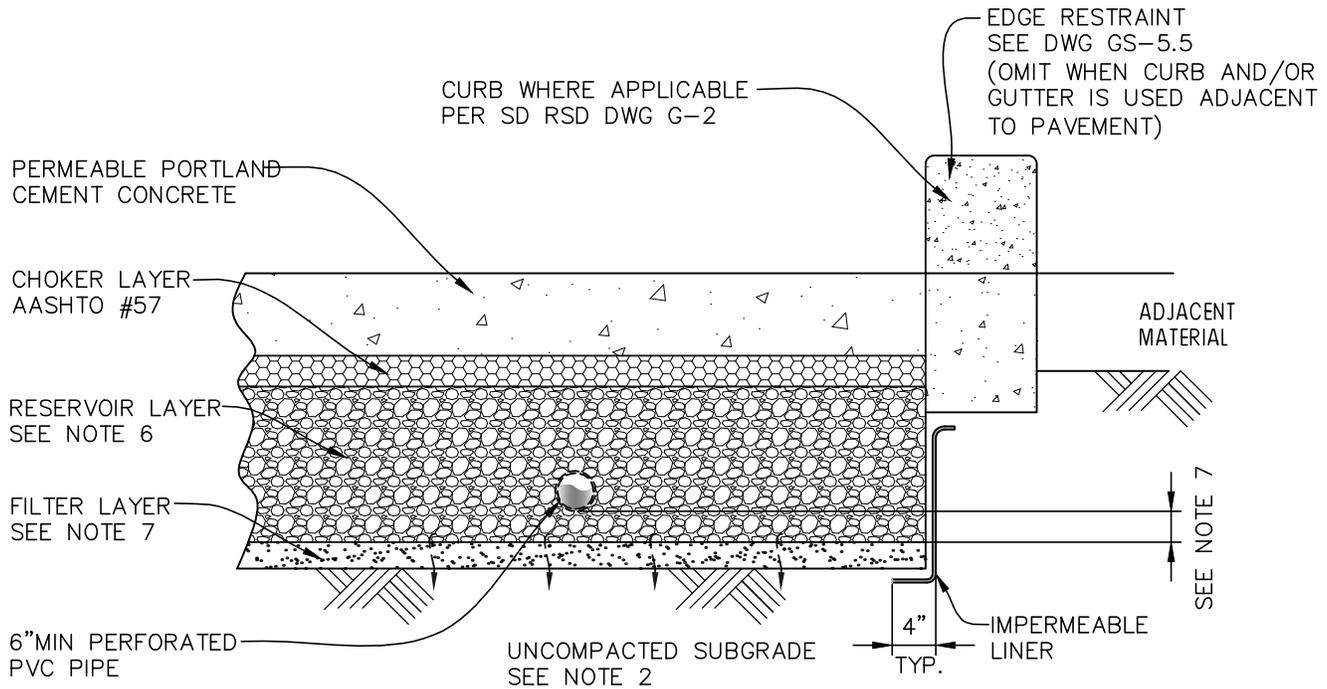
**NOTES:**

1. LOCATION, HEIGHTS, AND WIDTH OF CHECK DAMS TO BE SPECIFIED IN THE DESIGN PLANS.
2. SIZE OF ROCK OR AGGREGATE TO BE SPECIFIED IN THE DESIGN PLANS.
3. DEPTH OF CHECK DAM VARIES DEPENDING ON THE DEPTH OF THE FACILITY.
4. IF PRESENT, UNDERDRAIN TO PASS THROUGH CHECK DAM IN A NON-PERFORATED PVC PIPE
5. FOR EDGE TREATMENT OPTIONS SEE DWG GS-2.5a, GS-2.5b, AND GS-2.5c
6. FOR GABION BASKET CHECK DAM USE WELDED MESH TYPE WHEN UNDERDRAIN IS USED, TIE ALL WIRE BASKETS TOGETHER TO CREATE A CONTINUOUS STRUCTURE ALONG ITS LENGTH PER CALTRANS 2006 STANDARD PLAN D-100B.

DRAWING NOT TO SCALE

DRAWN BY: _____	CHECKED BY: _____	SAN DIEGO COUNTY DESIGN STANDARD	REVISIONS	APPROVED	DATE
RECOMMENDED BY: JEFF S. MOODY, P.E.					
APPROVED BY COUNTY ENGINEER		<b>ROCK CHECK DAM</b>			
DATE: _____					
DEYLAMIAN SIROUS, P.E. R.C.E. NO. 53192, EXP 6/30/2017			DRAWING NUMBER <b>GS-4.2b</b>		

**NOTE: THIS DRAWING IS TO BE INCLUDED ON PLANS UNTIL SIGNED BY THE COUNTY ENGINEER. ONCE SIGNED, IT CAN BE REFERENCED BY NUMBER**



MINIMUM PAVEMENT THICKNESS		
PAVEMENT ITEM	CLASS A	CLASS B
PERMEABLE CONCRETE	6"	8"
CHOKER LAYER	4"	4"
RESERVOIR LAYER	6" SEE NOTE 5	12" SEE NOTE 5
FILTER LAYER	4"	4"

CLASS A: ALLEY, PAVING LANE, LOCAL STREET  
 CLASS B: COLLECTOR OR ARTERIAL (NOT CURRENTLY ALLOWED)

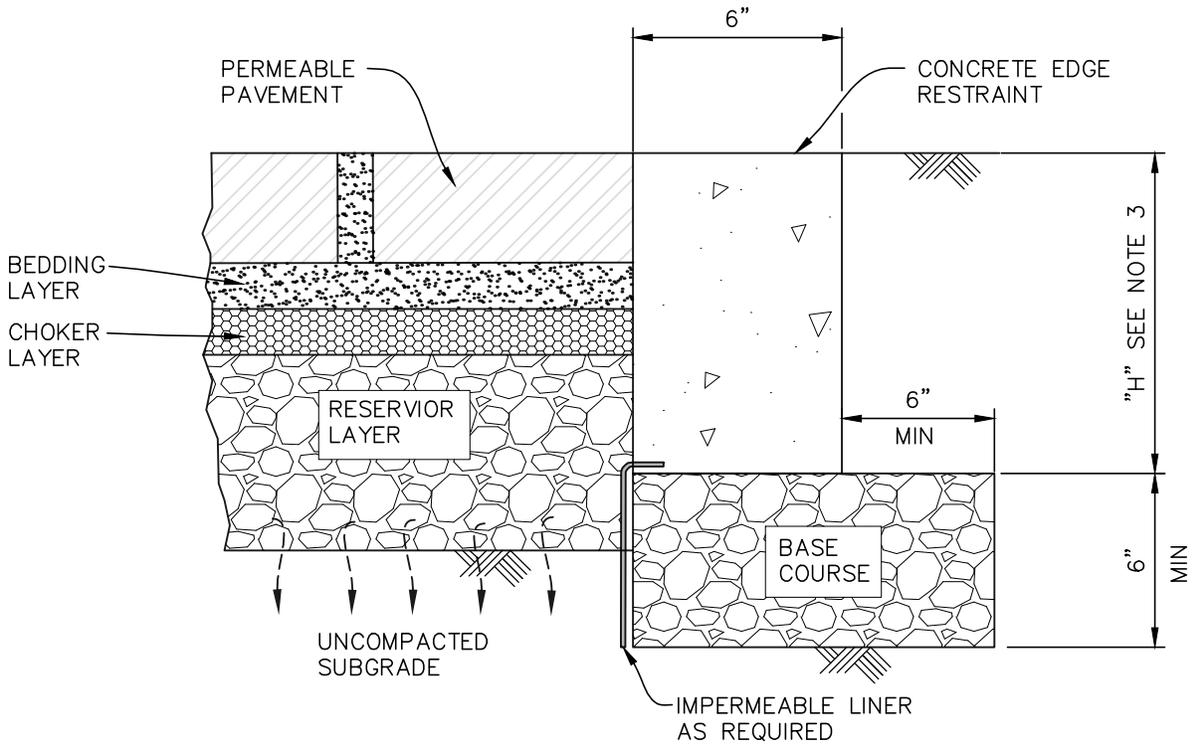
**NOTES:**

- DETAIL TO BE USED ONLY WHEN APPROVED BY COUNTY AND SHALL MEET CURRENT APPROVED COUNTY SPECIFICATION FOR "IMPERMEABLE PORTLAND CEMENT CONCRETE PAVEMENT".
- UNCOMPACTED SUBGRADE FOR AREAS DESIGNED FOR INFILTRATION PRACTICES. FOR OTHER AREAS, COMPACT AS SPECIFIED. FOR SOFT SOILS, INSTALL GEOGRID PER GEOTECHNICAL ENGINEER RECOMMENDATIONS.
- AGGREGATE LAYERS SHALL MEET CURRENT APPROVED COUNTY SPECIFICATION FOR "AGGREGATE FOR PERMEABLE PAVEMENT AND RAIN GARDEN".
- SEE DRAWING GS-5.4 FOR LONGITUDINAL AND CROSS SLOPE REQUIREMENTS.
- IMPERMEABLE LINER TO BE USED TO PROMOTE WATER RE-USE, PROTECT NEARBY BUILDING FOUNDATIONS, AND AVOID INFILTRATION AROUND UTILITIES.
- DEPTH OF RESERVOIR LAYER AS SHOWN ON DESIGN PLANS SHOULD BE SIZED TO ADDRESS STORMWATER CONVEYANCE REQUIREMENTS, AND PAVEMENTS STRUCTURAL DESIGN.
- ENHANCED DESIGN CONTAINS A WATER STORAGE LAYER AND AN INFILTRATION SUMP BENEATH THE UNDERDRAIN SIZED TO DRAIN THE DESIGN STORM WITHIN 96 HOURS.
- WHEN FILTER LAYER IS OMITTED, PROVIDE GEOTEXTILE BENEATH RESERVOIR LAYER MEETING CURRENT APPROVED COUNTY SPECIFICATION FOR GOESYNTHETICS.
- BOTTOM OF RESERVOIR LAYER SHALL BE AT LEAST 10' ABOVE THE SEASONAL HIGH WATER TABLE OR 2' ABOVE BEDROCK, AS DETERMINED BY GEOTECHNICAL INVESTIGATION.
- TOP OF PAVEMENT SHOULD BE DESIGNED TO ACHIEVE 1% MINIMUM SLOPE IN ANY DIRECTION.

DRAWING NOT TO SCALE

DRAWN BY: _____	CHECKED BY: _____	SAN DIEGO COUNTY DESIGN STANDARD	REVISIONS	APPROVED	DATE
RECOMMENDED BY: JEFF S. MOODY, P.E.					
APPROVED BY COUNTY ENGINEER		<b>PERMEABLE CONCRETE PAVEMENT</b>			
DATE: _____					
DEYLAMIAN SIROUS, P.E. R.C.E. NO. 53192, EXP 6/30/2017			DRAWING NUMBER <b>GS-5.1a</b>		

**NOTE: THIS DRAWING IS TO BE INCLUDED ON PLANS UNTIL SIGNED BY THE COUNTY ENGINEER. ONCE SIGNED, IT CAN BE REFERENCED BY NUMBER**



STONE TYPE FOR GREEN STREET ELEMENTS		
LAYER NAME	GREEN STREET ELEMENTS	
	PERMEABLE PAVEMENTS	RAIN GARDENS
RESERVOIR	#2 - #3	#57
CHOKER	#57	See Table 1-3 SD Green Street Specifications
SAND FILTER	#8	#8
BEDDING LAYER	#8	N/A

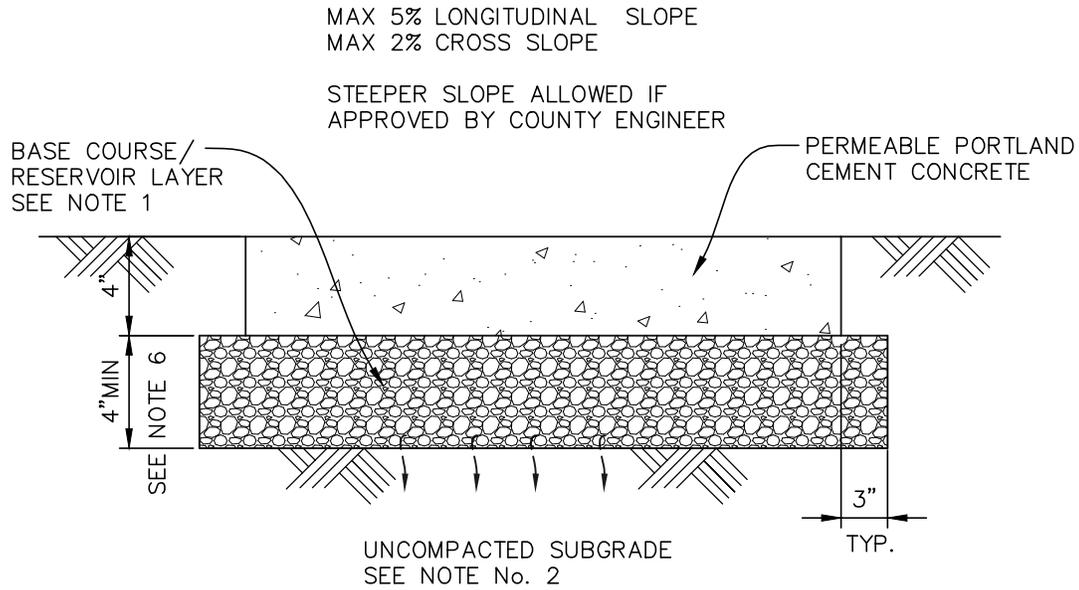
**NOTES:**

1. PERIMETER RESTRAINTS ARE REQUIRED FOR PERMEABLE INTERLOCKING CONCRETE PAVER SYSTEM. ENGINEER TO DETERMINE IF EDGE RESTRAINTS ARE NECESSARY FOR PERMEABLE ASPHALT AND PERMEABLE CONCRETE INSTALLATION.
2. MATERIALS, TYPE F, 3,500 PSI CONCRETE; OTHER TYPES OF EDGE RESTRAINT, SUCH AS STEEL OR PLASTIC SHALL BE ALLOWED AS APPROVED BY THE COUNTY ENGINEER, AND BASED ON MANUFACTURER'S RECOMMENDATIONS.
3. H = 10" FOR PERMEABLE ASPHALT CLASS B; 6" FOR PERMEABLE CONCRETE PAVERS AND PERMEABLE ASPHALT CLASS A.
4. FOR REGULAR PAVEMENT, USE CUTOFF WALL AT END OF PAVEMENT PER SAN DIEGO REGIONAL STANDARD DRAWING G-22.

DRAWING NOT TO SCALE

DRAWN BY: _____	CHECKED BY: _____	SAN DIEGO COUNTY DESIGN STANDARD	REVISIONS	APPROVED	DATE
RECOMMENDED BY: JEFF S. MOODY, P.E.					
APPROVED BY COUNTY ENGINEER		<b>PERMEABLE PAVEMENT EDGE RESTRAINT</b>			
DATE: _____ DEYLAMIAN SIROUS, P.E. R.C.E. NO. 53192, EXP 6/30/2017			DRAWING NUMBER <b>GS-5.5</b>		

**NOTE: THIS DRAWING IS TO BE INCLUDED ON PLANS UNTIL SIGNED BY THE COUNTY ENGINEER. ONCE SIGNED, IT CAN BE REFERENCED BY NUMBER**



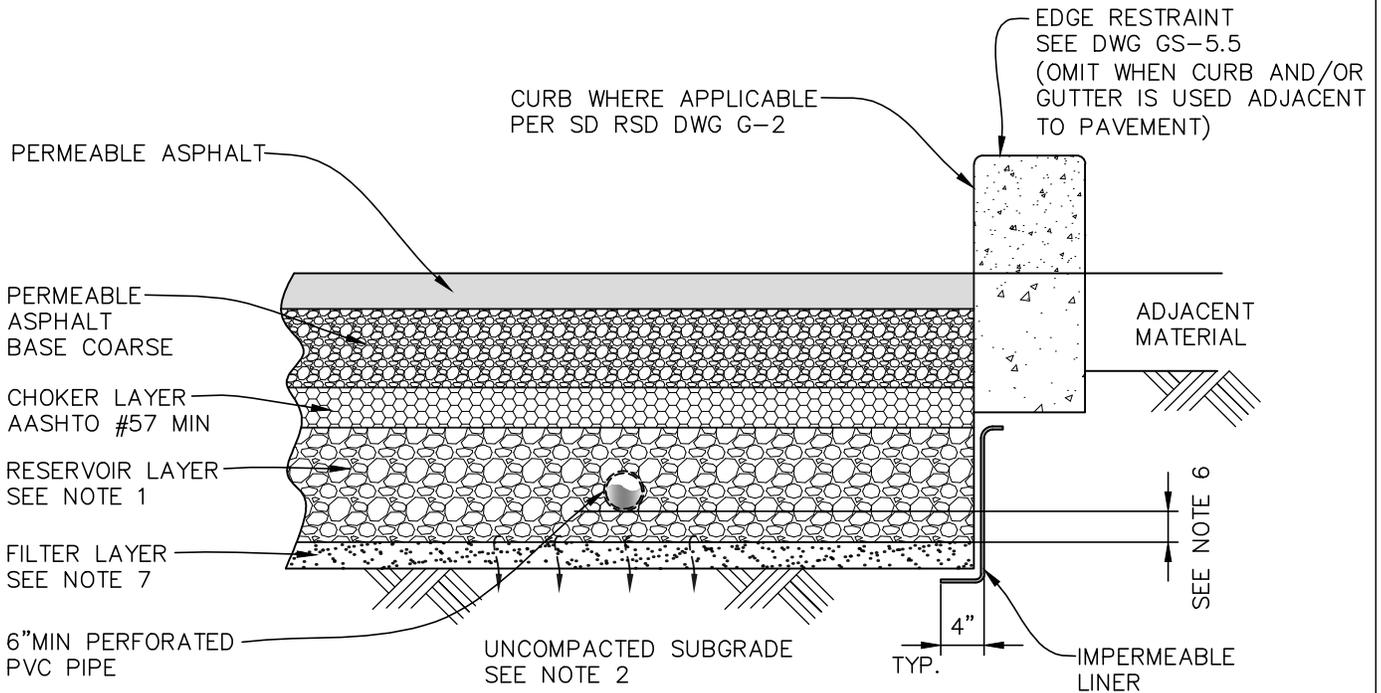
**NOTES:**

1. DETAIL TO BE USED ONLY WHEN APPROVED BY COUNTY AND SHALL MEET CURRENT APPROVED COUNTY SPECIFICATION FOR "PERVIOUS PORTLAND CEMENT CONCRETE PAVEMENT".
2. UNCOMPACTED SUBGRADE FOR AREAS DESIGNED FOR INFILTRATION PRACTICES. FOR OTHER AREAS, COMPACT AS SPECIFIED. FOR SOFT SOILS, INSTALL GEOGRID PER GEOTECHNICAL ENGINEER RECOMMENDATIONS.
3. AGGREGATE LAYERS SHALL MEET CURRENT APPROVED COUNTY SPECIFICATION FOR "AGGREGATE FOR PERMEABLE PAVEMENT AND RAIN GARDEN".
4. WHERE INSITU SOILS ARE NOT CONDUCIVE TO INFILTRATION OF DESIGN STORM VOLUME WITHIN 72 HOURS, UNDERDRAIN SHOULD BE CONSIDERED THROUGH COORDINATION WITH COUNTY ENGINEER.
5. IMPERMEABLE LINER TO BE USED TO PROMOTE WATER RE-USE, PROTECT NEARBY BUILDING FOUNDATIONS, AND AVOID INFILTRATION AROUND UTILITIES.
6. AGGREGATE DEPTH MAY BE GREATER THAN MINIMUM. AS SHOWN IN DESIGN PLANS TO ACHIEVE ADDITIONAL STORMWATER STORAGE.
7. BOTTOM OF RESERVOIR LAYER SHALL BE AT LEAST 10' ABOVE THE SEASONAL HIGH WATER TABLE OR 2' ABOVE BEDROCK, AS DETERMINED BY GEOTECHNICAL INVESTIGATION.
8. TOP OF PAVEMENT SHOULD BE DESIGNED TO ACHIEVE 1% MINIMUM SLOPE IN ANY DIRECTION.
9. IN CASE OF TREE PLANTINGS, STRUCTURAL SOIL MAY EXTEND UNDER RESERVOIR LAYER.

DRAWING NOT TO SCALE

DRAWN BY: _____	CHECKED BY: _____	SAN DIEGO COUNTY DESIGN STANDARD	REVISIONS	APPROVED	DATE
RECOMMENDED BY: JEFF S. MOODY, P.E.					
APPROVED BY COUNTY ENGINEER		<b>PERMEABLE CONCRETE PAVEMENT (SIDEWALK)</b>			
DATE: _____					
DEYLAMIAN SIROUS, P.E. R.C.E. NO. 53192, EXP 6/30/2017			DRAWING NUMBER	<b>GS-5.1b</b>	

**NOTE: THIS DRAWING IS TO BE INCLUDED ON PLANS UNTIL SIGNED BY THE COUNTY ENGINEER. ONCE SIGNED, IT CAN BE REFERENCED BY NUMBER**



MINIMUM PAVEMENT THICKNESS		
PAVEMENT ITEM	CLASS A	CLASS B
PERMEABLE ASPHALT	1.5"	3"
AC BASE COURSE	3"	6"
CHOKER LAYER	4"	4"
RESERVOIR LAYER	6" SEE NOTE 5	12" SEE NOTE 5
FILTER LAYER	4"	4"

CLASS A: ALLEY, PAVING LANE, LOCAL STREET  
 CLASS B: COLLECTOR OR ARTERIAL (NOT CURRENTLY ALLOWED)

**NOTES:**

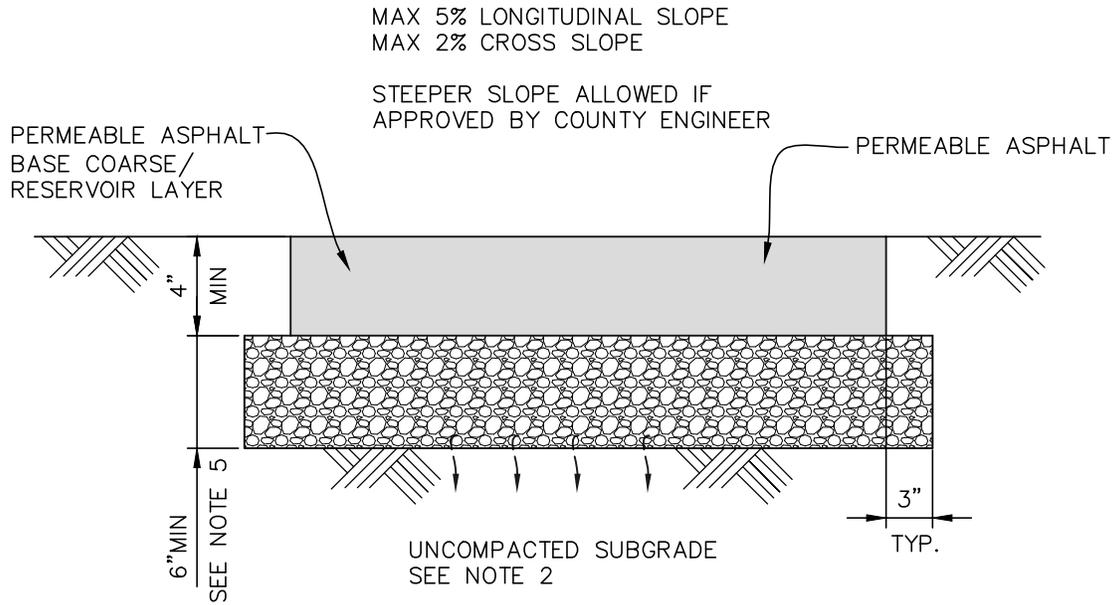
1. DETAIL TO BE USED ONLY WHEN APPROVED BY COUNTY AND SHALL MEET CURRENT APPROVED COUNTY SPECIFICATION FOR "PERMEABLE ASPHALT PAVEMENT".
2. UNCOMPACTED SUBGRADE FOR AREAS DESIGNED FOR INFILTRATION PRACTICES. FOR OTHER AREAS, COMPACT AS SPECIFIED. FOR SOFT SOILS, INSTALL GEOGRID PER GEOTECHNICAL ENGINEER RECOMMENDATIONS.

3. AGGREGATE LAYERS SHALL MEET CURRENT APPROVED COUNTY SPECIFICATION FOR "AGGREGATE FOR PERMEABLE PAVEMENT AND RAIN GARDEN".SEE DWG GS-5.4 FOR LONGITUDINAL AND CROSS SLOPE REQUIREMENTS.
4. IMPERMEABLE LINER TO BE USED TO PROMOTE WATER RE-USE, PROTECT NEARBY BUILDING FOUNDATIONS, AND AVOID INFILTRATION AROUND UTILITIES.
5. DEPTH OF RESERVOIR LAYER AS SHOWN ON DESIGN PLANS SHOULD BE SIZED TO ADDRESS STORMWATER CONVEYANCE REQUIREMENTS, AND PAVEMENTS STRUCTURAL DESIGN.
6. ENHANCED DESIGN CONTAINS A WATER STORAGE LAYER AND AN INFILTRATION SUMP BENEATH THE UNDERDRAIN SIZED TO DRAIN THE DESIGN STORM WITHIN 96 HOURS.
7. WHEN FILTER LAYER IS OMITTED, PROVIDE GEOTEXTILE BENEATH RESERVOIR LAYER MEETING CURRENT APPROVED COUNTY SPECIFICATION FOR GOESYNTHETICS MATERIALS.
8. BOTTOM OF RESERVOIR LAYER SHALL BE AT LEAST 10' ABOVE THE SEASONAL HIGH WATER TABLE OR 2' ABOVE BEDROCK, AS DETERMINED BY GEOTECHNICAL INVESTIGATION.
9. TOP OF PAVEMENT SHOULD BE DESIGNED TO ACHIEVE 1% MINIMUM SLOPE IN ANY DIRECTION.

DRAWING NOT TO SCALE

DRAWN BY: _____	CHECKED BY: _____	SAN DIEGO COUNTY DESIGN STANDARD	REVISIONS	APPROVED	DATE
RECOMMENDED BY: JEFF S. MOODY, P.E.					
APPROVED BY COUNTY ENGINEER		<b>PERMEABLE ASPHALT PAVEMENT</b>			
DATE: _____					
DEYLAMIAN SIROUS, P.E. R.C.E. NO. 53192, EXP 6/30/2017			DRAWING NUMBER	<b>GS-5.2a</b>	

**NOTE: THIS DRAWING IS TO BE INCLUDED ON PLANS UNTIL SIGNED BY THE COUNTY ENGINEER. ONCE SIGNED, IT CAN BE REFERENCED BY NUMBER**



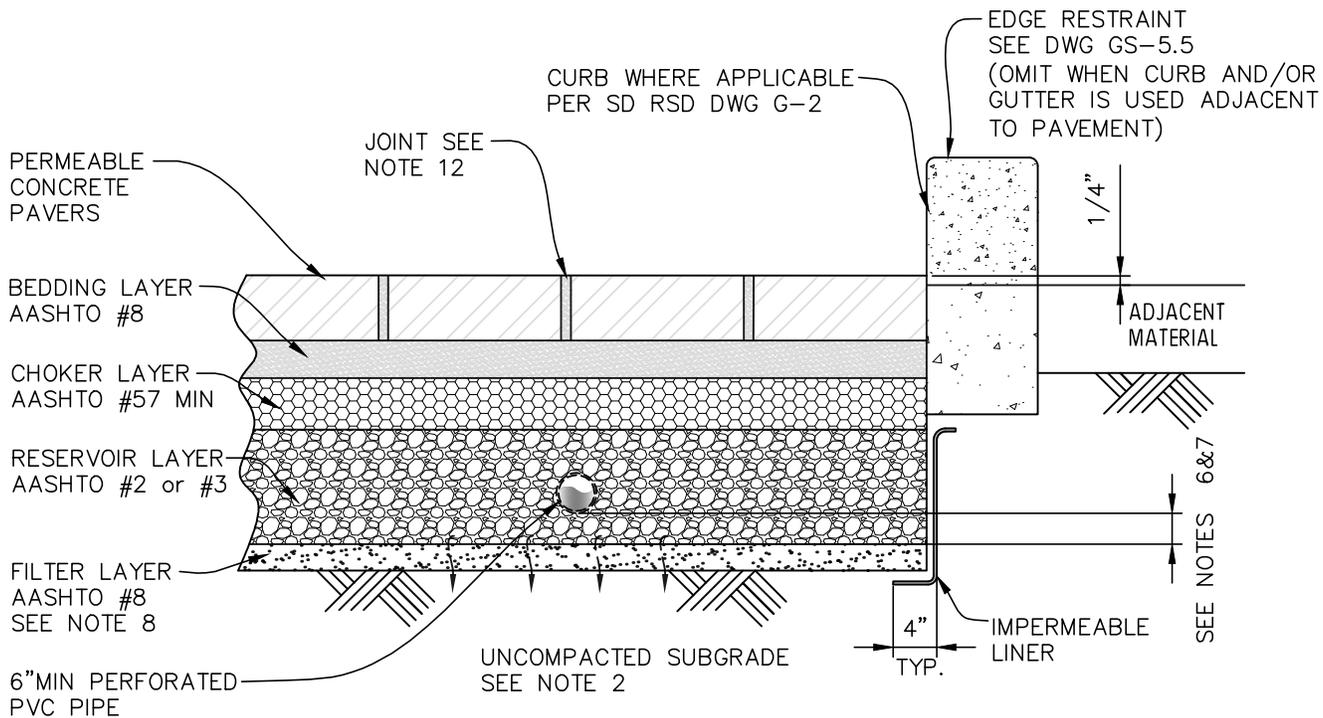
**NOTES:**

1. DETAIL TO BE USED ONLY WHEN APPROVED BY COUNTY AND SHALL MEET CURRENT APPROVED COUNTY SPECIFICATION FOR "PERMEABLE ASPHALT PAVEMENT".
2. UNCOMPACTED SUBGRADE FOR AREAS DESIGNED FOR INFILTRATION PRACTICES. FOR OTHER AREAS, COMPACT AS SPECIFIED. FOR SOFT SOILS, INSTALL GEOGRID PER GEOTECHNICAL ENGINEER RECOMMENDATIONS.
3. AGGREGATE LAYERS SHALL MEET CURRENT APPROVED COUNTY SPECIFICATION FOR "AGGREGATE FOR PERMEABLE PAVEMENT AND RAIN GARDEN".
4. WHERE INSITU SOILS ARE NOT CONDUCTIVE TO INFILTRATION OF DESIGN STORM VOLUME WITHIN 72 HOURS, UNDERDRAIN SHOULD BE CONSIDERED THROUGH COORDINATION WITH COUNTY ENGINEER.
5. IMPERMEABLE LINER TO BE USED TO PROMOTE WATER RE-USE, PROTECT NEARBY BUILDING FOUNDATIONS, AND AVOID INFILTRATION AROUND UTILITIES.
6. AGGREGATE DEPTH MAY BE GREATER THAN MINIMUM AS SHOWN IN DESIGN PLANS TO ACHIEVE ADDITIONAL STORMWATER STORAGE.
7. BOTTOM OF RESERVOIR LAYER SHALL BE AT LEAST 10' ABOVE THE SEASONAL HIGH WATER TABLE OR 2' ABOVE BEDROCK, AS DETERMINED BY GEOTECHNICAL INVESTIGATION.
8. TOP OF PAVEMENT SHOULD BE DESIGNED TO ACHIEVE 1% MINIMUM SLOPE IN ANY DIRECTION.

DRAWING NOT TO SCALE

DRAWN BY: _____	CHECKED BY: _____	SAN DIEGO COUNTY DESIGN STANDARD	REVISIONS	APPROVED	DATE
RECOMMENDED BY: JEFF S. MOODY, P.E.					
APPROVED BY COUNTY ENGINEER		<b>PERMEABLE ASPHALT PAVEMENT (SIDEWALK)</b>			
DATE: _____					
DEYLAMIAN SIROUS, P.E. R.C.E. NO. 53192, EXP 6/30/2017			DRAWING NUMBER <b>GS-5.2b</b>		

**NOTE: THIS DRAWING IS TO BE INCLUDED ON PLANS UNTIL SIGNED BY THE COUNTY ENGINEER. ONCE SIGNED, IT CAN BE REFERENCED BY NUMBER**



**NOTES:**

1. DETAIL TO BE USED ONLY WHEN APPROVED BY COUNTY AND SHALL MEET CURRENT APPROVED COUNTY SPECIFICATION FOR "PERMEABLE CONCRETE PAVERS".
2. UNCOMPACTED SUBGRADE FOR AREAS DESIGNED FOR INFILTRATION PRACTICES. FOR OTHER AREAS, COMPACT AS SPECIFIED SPECIFICATION. FOR SOFT SOILS, INSTALL GEOGRID PER GEOTECHNICAL ENGINEER RECOMMENDATIONS.
3. AGGREGATE LAYERS SHALL MEET CURRENT APPROVED COUNTY SPECIFICATION FOR "AGGREGATE FOR PERMEABLE PAVEMENT AND RAIN GARDEN".
4. SEE DWG GS-5.4 FOR LONGITUDINAL AND CROSS SLOPE REQUIREMENTS.
5. IMPERMEABLE LINER TO BE USED TO PROMOTE WATER RE-USE, PROTECT NEARBY BUILDING FOUNDATIONS AND AVOID INFILTRATION AROUND UTILITIES.
6. DEPTH OF RESERVOIR LAYER AS SHOWN ON DESIGN PLANS SHOULD BE SIZED TO ADDRESS STORMWATER CONVEYANCE REQUIREMENTS AND PAVEMENT STRUCTURAL DESIGN.
7. ENHANCED DESIGN CONTAINS A WATER STORAGE LAYER AND AN INFILTRATION SUMP BENEATH THE UNDERDRAIN SIZED TO DRAIN THE DESIGN STORM WITHIN 96 HOURS.
8. WHEN FILTER LAYER IS OMITTED, PROVIDE GEOTEXTILE BENEATH RESERVOIR LAYER MEETING CURRENT APPROVED COUNTY SPECIFICATION FOR "GEO SYNTHETIC MATERIALS".
9. BOTTOM OF RESERVOIR LAYER SHALL BE AT LEAST 10' ABOVE THE SEASONAL HIGH WATER TABLE OR 2' ABOVE BEDROCK, AS DETERMINED BY GEOTECHNICAL INVESTIGATION.
10. TOP OF PAVEMENT SHOULD BE DESIGNED TO ACHIEVE 1% MINIMUM SLOPE IN ANY DIRECTION.
11. OTHER TYPES OF EDGE RESTRAINTS SUCH AS STEEL OR PLASTIC SHALL BE ALLOWED AS APPROVED BY THE COUNTY ENGINEER AND BASED ON MANUFACTURER'S RECOMMENDATIONS.
12. JOINT TO HAVE 1/2" MAXIMUM GAP IN ACCORDANCE WITH THE LATEST ADA REQUIREMENTS AND TO BE FILLED WITH AASHTO#8 OR APPROVED EQUIVALENT. MINIMUM GAP SHALL BE 1/4" OR PER MANUFACTURER'S RECOMMENDATIONS FOR PERMEABLE CONCRETE PAVERS.

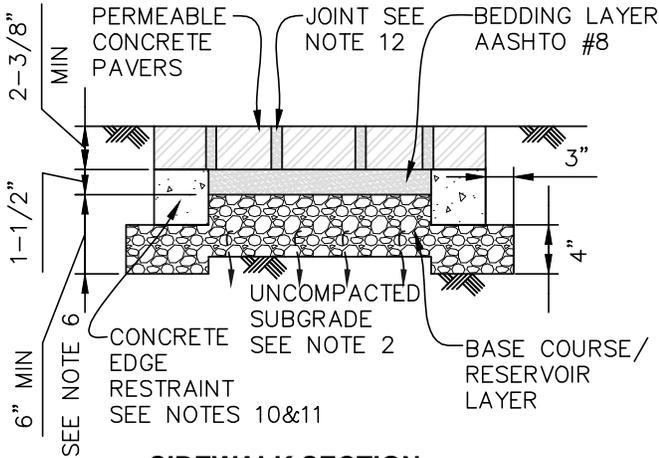
DRAWING NOT TO SCALE

DRAWN BY: _____	CHECKED BY: _____	SAN DIEGO COUNTY DESIGN STANDARD	REVISIONS	APPROVED	DATE
RECOMMENDED BY: JEFF S. MOODY, P.E.					
APPROVED BY COUNTY ENGINEER		<b>PERMEABLE PAVERS</b>			
DATE: _____					
DEYLAMIAN SIROUS, P.E. R.C.E. NO. 53192, EXP 6/30/2017			DRAWING NUMBER	<b>GS-5.3a</b>	

**NOTE: THIS DRAWING IS TO BE INCLUDED ON PLANS UNTIL SIGNED BY THE COUNTY ENGINEER. ONCE SIGNED, IT CAN BE REFERENCED BY NUMBER**

MAX 5% LONGITUDINAL SLOPE  
MAX 2% CROSS SLOPE

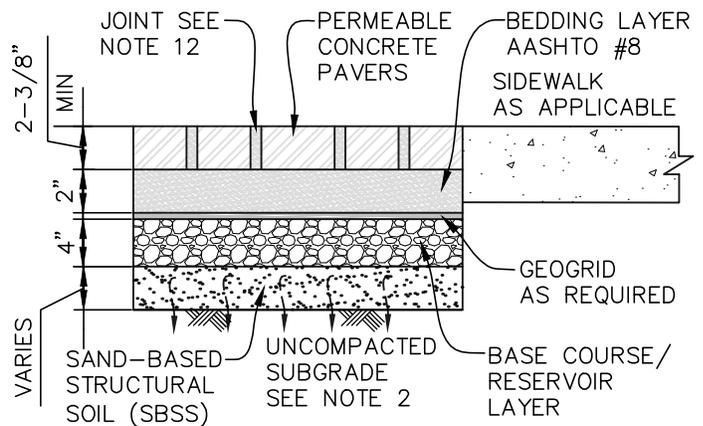
STEEPER SLOPE ALLOWED IF  
APPROVED BY COUNTY ENGINEER



**SIDEWALK SECTION**

MAX 5% LONGITUDINAL SLOPE  
MAX 2% CROSS SLOPE

STEEPER SLOPE ALLOWED IF  
APPROVED BY COUNTY ENGINEER



**PERMEABLE PAVERS OVER  
SAND-BASED STRUCTURAL SOIL**

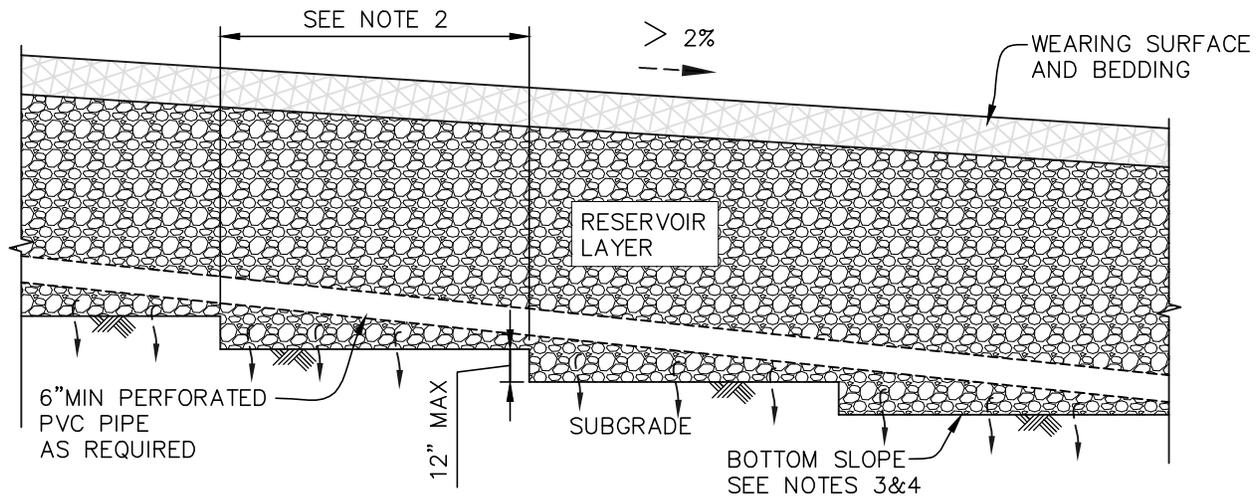
**NOTES:**

1. DETAIL TO BE USED ONLY WHEN APPROVED BY COUNTY AND SHALL MEET CURRENT APPROVED COUNTY SPECIFICATION FOR POROUS ASPHALT PAVEMENT.
2. UNCOMPACTED SUBGRADE FOR AREAS DESIGNED FOR INFILTRATION PRACTICES. FOR OTHER AREAS, COMPACT AS SPECIFIED. FOR SOFT SOILS, INSTALL GEOGRID PER GEOTECHNICAL ENGINEER RECOMMENDATIONS.
3. AGGREGATE LAYERS SHALL MEET CURRENT APPROVED COUNTY SPECIFICATION FOR "AGGREGATE FOR PERMEABLE PAVEMENT AND RAIN GARDEN".
4. WHERE INSITU SOILS ARE NOT CONDUCIVE TO INFILTRATION OF DESIGN STORM VOLUME WITHIN 72 HOURS, UNDERDRAIN SHOULD BE CONSIDERED THROUGH COORDINATION WITH COUNTY ENGINEER.
5. IMPERMEABLE LINER TO BE USED TO PROMOTE WATER RE-USE, PROTECT NEARBY BUILDING FOUNDATIONS, AND AVOID INFILTRATION AROUND UTILITIES.
6. AGGREGATE DEPTH MAY BE GREATER THAN MINIMUM AS SHOWN IN DESIGN PLANS TO ACHIEVE ADDITIONAL STORMWATER STORAGE.
7. BOTTOM OF PERMEABLE PAVEMENT STRUCTURE SHALL BE AT LEAST 10' ABOVE THE SEASONAL HIGH WATER TABLE OR 2' ABOVE BEDROCK, AS DETERMINED BY GEOTECHNICAL INVESTIGATION.
8. TOP OF PAVEMENT SHOULD BE DESIGNED TO ACHIEVE 1% MINIMUM SLOPE IN ANY DIRECTION.
9. IN AREAS OF TREE PLANTINGS WHICH CALL FOR SAND BASED STRUCTURAL SOIL (SSBS). THE SSBS MAY EXTEND UNDER THE AGGREGATE BASE LAYER OF THE SIDEWALK.
10. CONCRETE EDGE RESTRAINT MIN 4" WIDE AND 7 1/2" DEEP; MORTAR OR POLYMER ADHERED PAVERS TO TOP; ALTERNATIVELY EXTEND EDGE RESTRAINT TO SURFACE.
11. OTHER TYPE OF EDGE RESTRAINTS SUCH AS STEEL OR PLASTIC SHALL BE ALLOWED AS APPROVED BY COUNTY ENGINEER AND BASED ON MANUFACTURER'S RECOMMENDATIONS.
12. JOINT TO HAVE 1/2" MAXIMUM GAP IN ACCORDANCE WITH THE LATEST ADA REQUIREMENTS AND TO BE FILLED WITH AASHTO#8 OR APPROVED EQUIVALENT. MINIMUM GAP SHALL BE 1/4" OR PER MANUFACTURER'S RECOMMENDATIONS FOR PERMEABLE CONCRETE PAVERS.

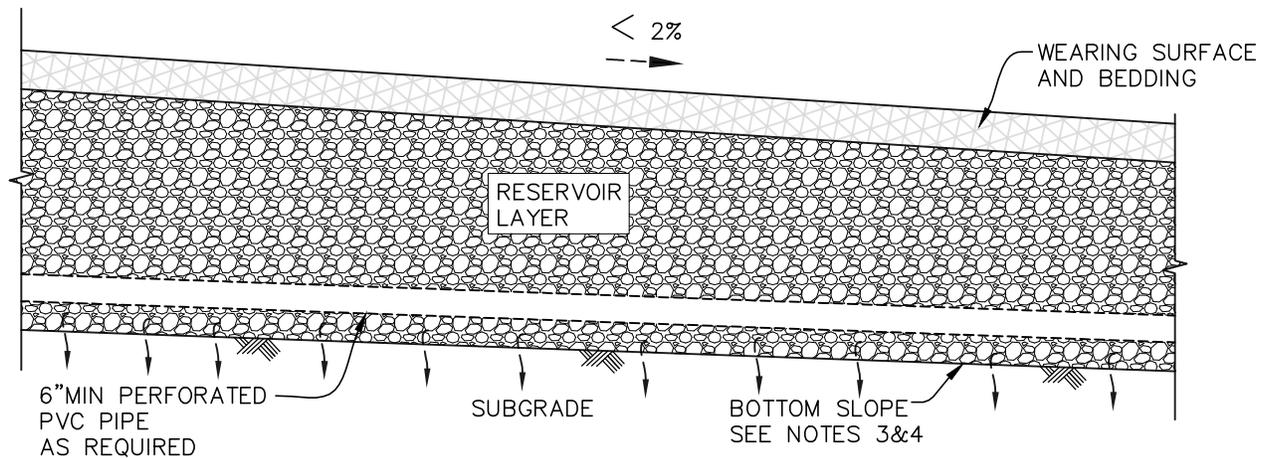
DRAWING NOT TO SCALE

DRAWN BY: _____	CHECKED BY: _____	SAN DIEGO COUNTY DESIGN STANDARD	REVISIONS	APPROVED	DATE
RECOMMENDED BY: JEFF S. MOODY, P.E.					
APPROVED BY COUNTY ENGINEER		<b>PERMEABLE PAVERS (SIDEWALK)</b>			
DATE: _____					
DEYLAMIAN SIROUS, P.E. R.C.E. NO. 53192, EXP 6/30/2017			DRAWING NUMBER	<b>GS-5.3b</b>	

**NOTE: THIS DRAWING IS TO BE INCLUDED ON PLANS UNTIL SIGNED BY THE COUNTY ENGINEER. ONCE SIGNED, IT CAN BE REFERENCED ON PLANS**



**TERRACED SLOPE  
LONGITUDINAL SLOPE > 2%**



**TERRACED SLOPE  
LONGITUDINAL SLOPE < 2%**

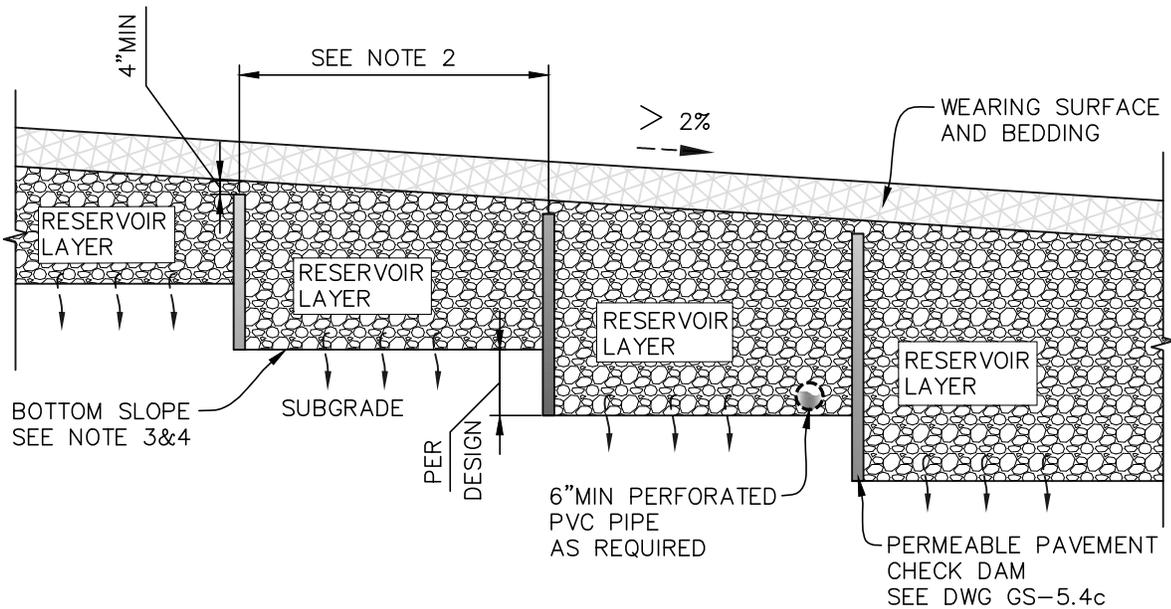
**NOTES:**

1. CHECK DAMS TO BE USED FOR INSTALLATION WITH BOTTOM SLOPES GREATER THAN 2% LONGITUDINAL OR AS DIRECTED BY THE CONTRACT DOCUMENTS.
2. DISTANCE BETWEEN STEPS IS DETERMINED BY THE SLOPE OF THE PAVEMENT TO ACHIEVE A STEP NO MORE THAN 12" TALL.
3. BOTTOM SLOPE=0% TO 5% BUT NOT STEEPER THAN TOP SLOPE, PER DESIGN PLANS. ENGINEER TO DESIGN SYSTEM TO ACHIEVE STORAGE, DRAW-DOWN, AND STRUCTURAL REQUIREMENTS. BOTTOM SLOPE DOES NOT HAVE TO BE PARALLEL TO TOP SLOPE.
4. FOR FACILITIES WITH IMPERMEABLE LINER, MINIMUM BOTTOM SLOPE SHALL BE 2% TO DRAIN DRY.
5. TRANSVERSE BOTTOM SLOPES AND CROSS SLOPES SHALL BE LESS THAN 3%.

DRAWING NOT TO SCALE

DRAWN BY: _____	CHECKED BY: _____	SAN DIEGO COUNTY DESIGN STANDARD	REVISIONS	APPROVED	DATE
RECOMMENDED BY: JEFF S. MOODY, P.E.					
APPROVED BY COUNTY ENGINEER		<b>PERMEABLE PAVEMENTS ELEVATION - 1</b>			
DATE: _____					
DEYLAMIAN SIROUS, P.E. R.C.E. NO. 53192, EXP 6/30/2017			DRAWING NUMBER <b>GS-5.4a</b>		

**NOTE: THIS DRAWING IS TO BE INCLUDED ON PLANS UNTIL SIGNED BY THE COUNTY ENGINEER. ONCE SIGNED, IT CAN BE REFERENCED ON PLANS**



**LONGITUDINAL SLOPE > 2%**

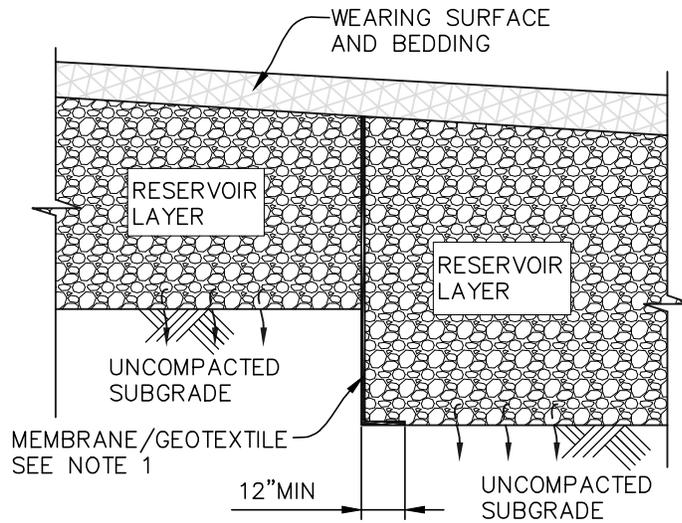
**NOTES:**

1. CHECK DAMS TO BE USED FOR INSTALLATION WITH BOTTOM SLOPES GREATER THAN 2% LONGITUDINAL, OR AS DIRECTED BY THE CONTRACT DOCUMENTS.
2. DISTANCE BETWEEN STEPS IS DETERMINED BY THE SLOPE OF THE PAVEMENT TO ACHIEVE A STEP NO MORE THAN 12" TALL.
3. BOTTOM SLOPE = 0% TO 5% BUT NOT STEEPER THAN TOP SLOPE, PER DESIGN PLANS. ENGINEER TO DESIGN SYSTEM TO ACHIEVE STORAGE, DRAW-DOWN, AND STRUCTURAL REQUIREMENTS. BOTTOM SLOPE DOES NOT HAVE TO BE PARALLEL TO TOP SLOPE.
4. FOR FACILITIES WITH WATERPROOF MEMBRANE, MINIMUM BOTTOM SLOPE SHALL BE 2% TO DRAIN DRY.
5. TRANSVERSE BOTTOM SLOPES AND CROSS SLOPES SHALL BE LESS THAN 3%.

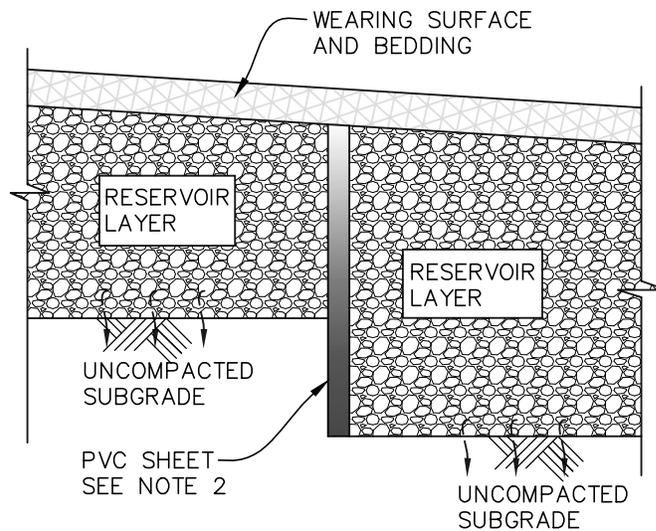
DRAWING NOT TO SCALE

DRAWN BY: _____	CHECKED BY: _____	SAN DIEGO COUNTY DESIGN STANDARD	REVISIONS	APPROVED	DATE
RECOMMENDED BY: JEFF S. MOODY, P.E.					
APPROVED BY COUNTY ENGINEER		<b>PERMEABLE PAVEMENTS ELEVATION - 2</b>			
DATE: _____					
DEYLAMIAN SIROUS, P.E. R.C.E. NO. 53192, EXP 6/30/2017			DRAWING NUMBER	<b>GS-5.4b</b>	

**NOTE: THIS DRAWING IS TO BE INCLUDED ON PLANS UNTIL SIGNED BY THE COUNTY ENGINEER. ONCE SIGNED, IT CAN BE REFERENCED ON PLANS**



**MEMBRANE/GEOTEXTILE  
CHECK DAM**



**PVC SHEET  
CHECK DAM**

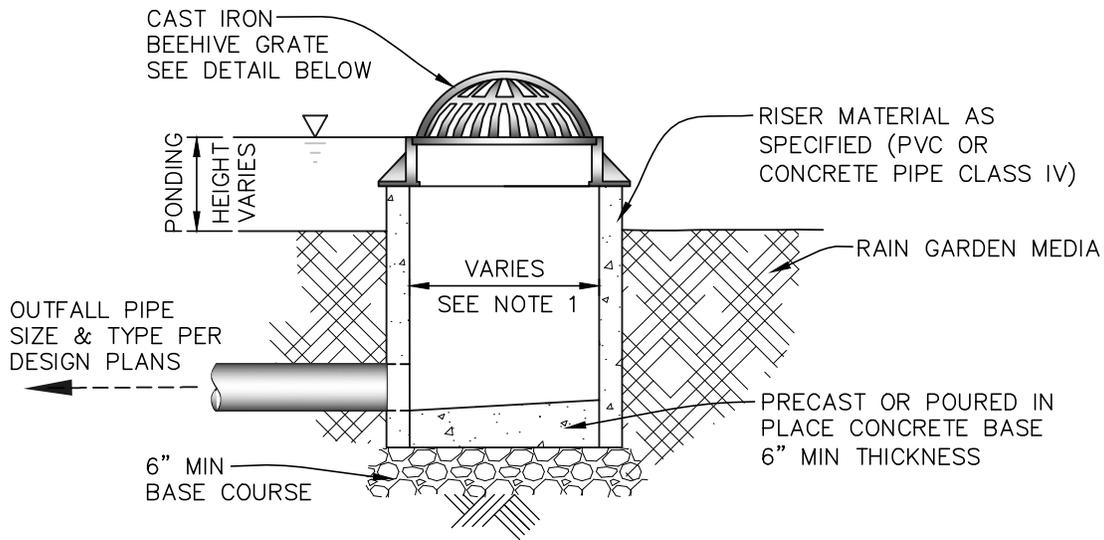
**NOTES:**

1. IMPERMEABLE LINER OR LOW PERMEABILITY GEOTEXTILE (PERMITTIVITY OF 0.05 SEC OR LESS).
2. SHEET TO BE 3/8" PVC SHEET TYPE I, GRAY.

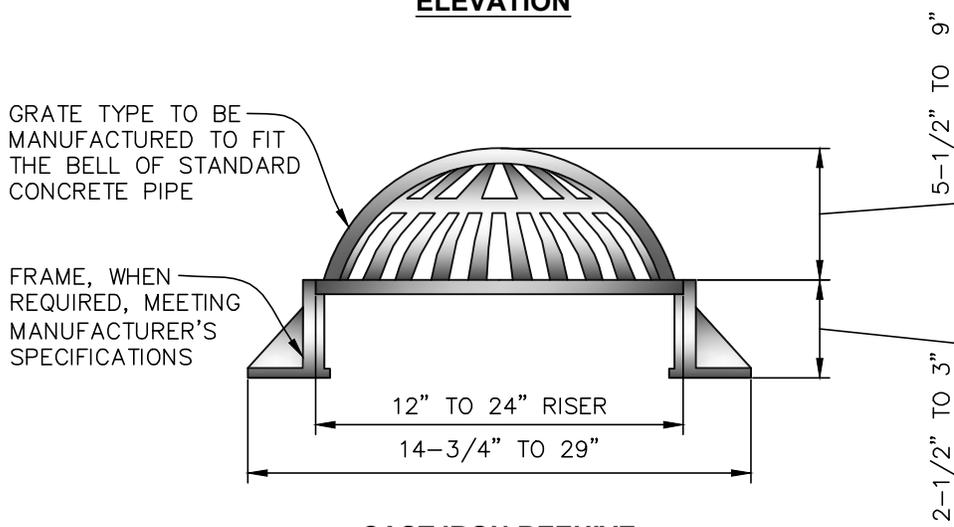
DRAWING NOT TO SCALE

DRAWN BY: _____	CHECKED BY: _____	SAN DIEGO COUNTY DESIGN STANDARD	REVISIONS	APPROVED	DATE
RECOMMENDED BY: JEFF S. MOODY, P.E.					
APPROVED BY COUNTY ENGINEER		<b>PERMEABLE PAVEMENT CHECK DAMS</b>			
DATE: _____					
DEYLAMIAN SIROUS, P.E. R.C.E. NO. 53192, EXP 6/30/2017			DRAWING NUMBER <b>GS-5.4c</b>		

**NOTE: THIS DRAWING IS TO BE INCLUDED ON PLANS UNTIL SIGNED BY THE COUNTY ENGINEER. ONCE SIGNED, IT CAN BE REFERENCED ON PLANS**



**ELEVATION**



**CAST IRON BEEHIVE GRATE DETAIL**

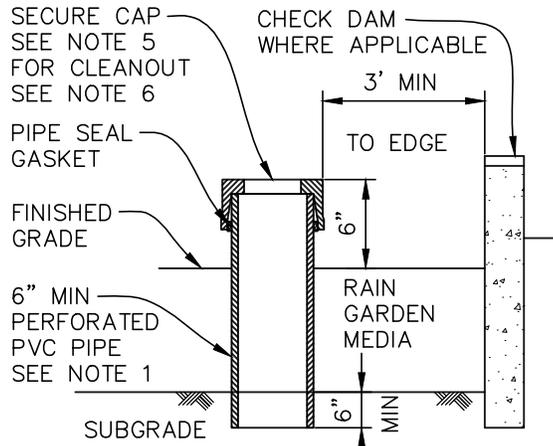
**NOTES:**

1. MINIMUM OPENING SIZE IN GRATE SHALL BE 1-1/4".
2. SIZE OF GRATE SHALL MATCH SIZE OF THE RISER, PER PLANS, SHALL FIT SNUG, AND SHALL BE REMOVABLE FOR MAINTENANCE PURPOSES.
3. ALTERNATIVE MATERIAL TO CAST IRON SHALL BE ALLOWED AS APPROVED BY COUNTY ENGINEER.

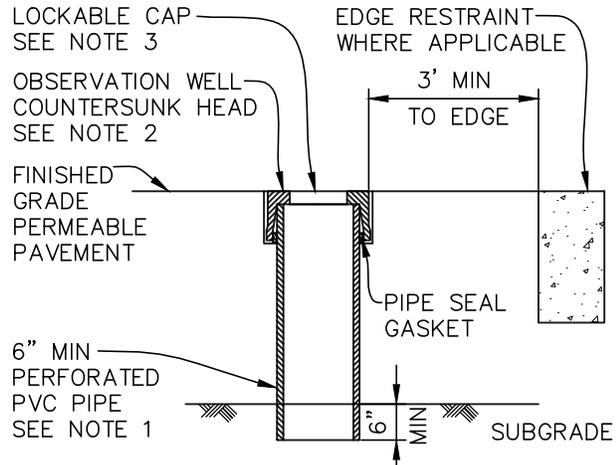
DRAWING NOT TO SCALE

DRAWN BY: _____	CHECKED BY: _____	SAN DIEGO COUNTY DESIGN STANDARD	REVISIONS	APPROVED	DATE
RECOMMENDED BY: JEFF S. MOODY, P.E.					
APPROVED BY COUNTY ENGINEER		<b>OVERFLOW RISER WITH BEEHIVE GRATE</b>			
DATE: _____					
DEYLAMIAN SIROUS, P.E. R.C.E. NO. 53192, EXP 6/30/2017			DRAWING NUMBER	<b>GS-6.1</b>	

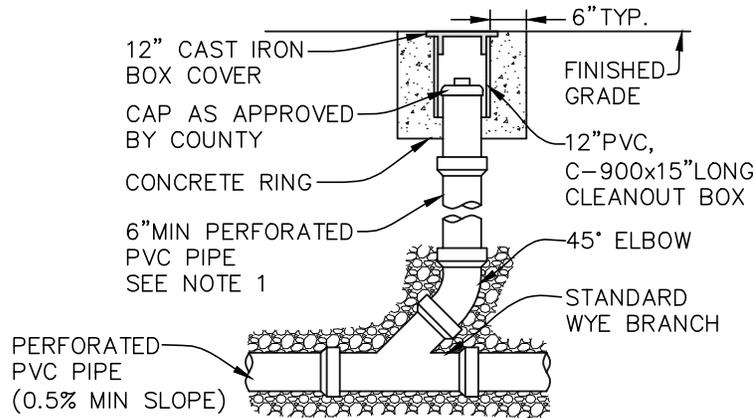
**NOTE: THIS DRAWING IS TO BE INCLUDED ON PLANS UNTIL SIGNED BY THE COUNTY ENGINEER. ONCE SIGNED, IT CAN BE REFERENCED ON PLANS**



**IN RAIN GARDEN**



**IN PERMEABLE PAVEMENT**



STANDARD WYE BRANCH  
SEE SDR SC-01 FOR ADDITIONAL DETAILS

**CLEANOUT IN PERMEABLE PAVEMENT**

(SEE NOTE 6)

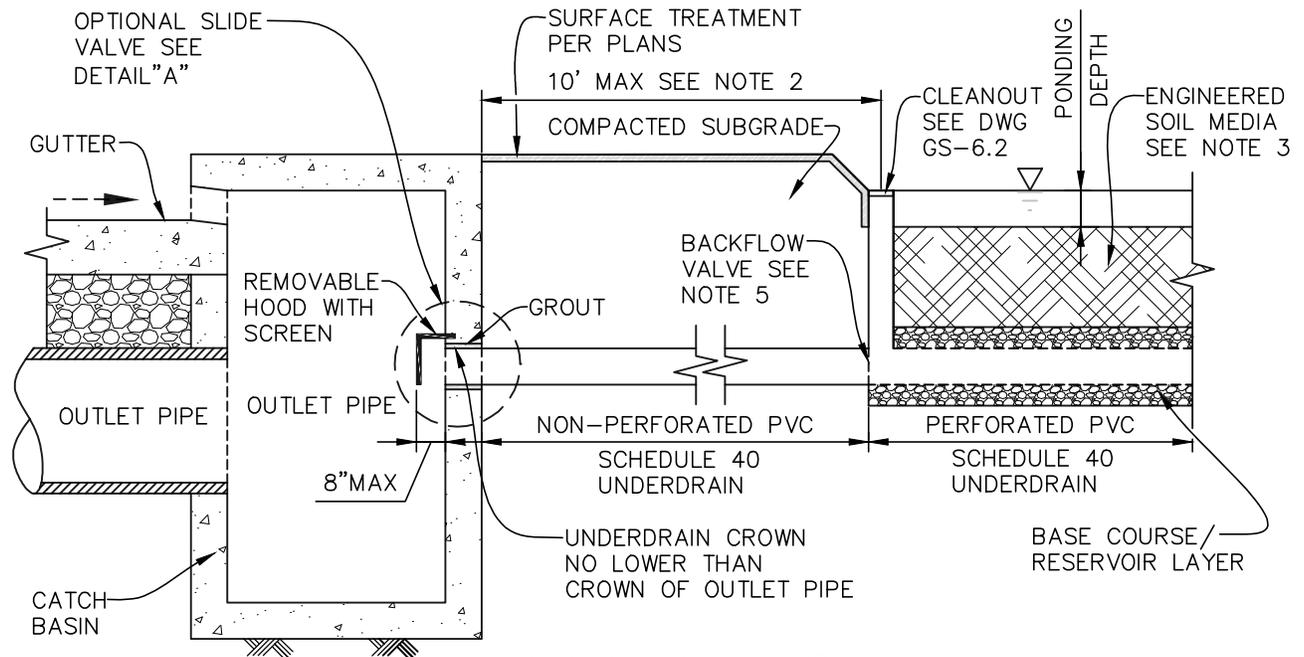
**NOTES:**

1. PROVIDE A TUBE MADE OF NON-CORROSIVE MATERIAL, SCHEDULE 40 PVC OR EQUAL, AT LEAST 3 FEET LONG WITH AN INSIDE DIAMETER OF 6" MINIMUM. PERFORATED PIPE IS REQUIRED FOR ALL OBSERVATION WELLS, OR CLEANOUTS USED AS OBSERVATION WELLS.
2. FACTORY ATTACHED BRASS OR HIGH IMPACT PLASTIC HEAD WITH RIBS TO PREVENT ROTATION WHEN REMOVING LOCKABLE CAP.
3. LOCKABLE CAP SHALL BE BRASS AND RATED FOR HS-20 LOADING IN VEHICULAR AREAS, MOUNTED FLUSH TO GRADE. LOCKABLE CAP MAY BE HIGH IMPACT PLASTIC THAT IS UV STABLE IN NON-VEHICULAR LOADING AREA, AT LEAST 6 INCHES ABOVE GRADE.
4. IN FACILITIES SUBJECT TO VEHICULAR TRAFFIC, CONCRETE APRONS AROUND CLEANOUTS ARE AN OPTION, AS SHOWN IN DESIGN PLANS.
5. CAP ON RISERS IN RAIN GARDEN FACILITY SHALL BE PVC SCREW IN PLUG.
6. FOR CLEANOUT IN RAIN GARDEN (NOT SHOWN), USE SIMILAR DETAIL, BUT USE PVC SCREW CAP SET 6" ABOVE FINISHED GRADE.

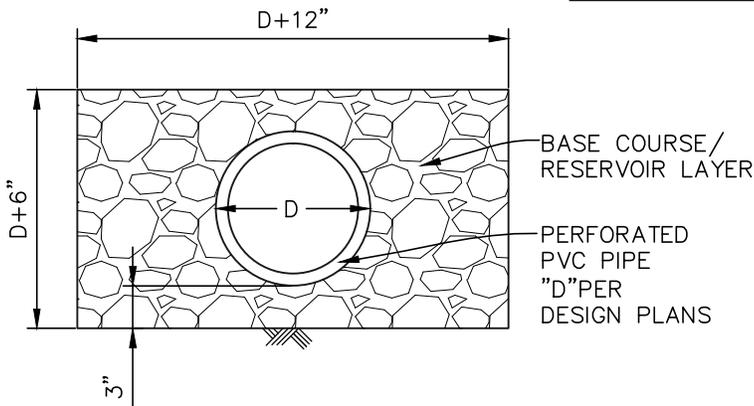
DRAWING NOT TO SCALE

DRAWN BY: _____	CHECKED BY: _____	SAN DIEGO COUNTY DESIGN STANDARD	REVISIONS	APPROVED	DATE
RECOMMENDED BY: JEFF S. MOODY, P.E.					
APPROVED BY COUNTY ENGINEER		<b>STORMWATER FACILITY CLEANOUT/OBSERVATION WELL</b>			
DATE: _____					
DEYLAMIAN SIROUS, P.E. R.C.E. NO. 53192, EXP 6/30/2017			DRAWING NUMBER	<b>GS-6.2</b>	

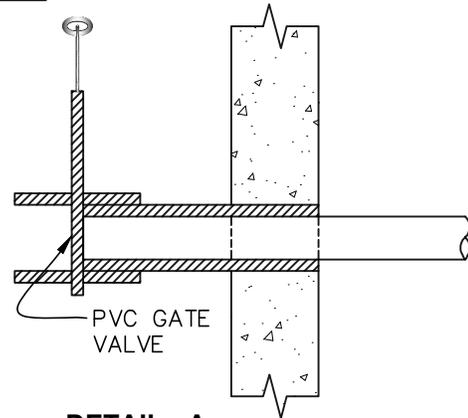
**NOTE: THIS DRAWING IS TO BE INCLUDED ON PLANS UNTIL SIGNED BY THE COUNTY ENGINEER. ONCE SIGNED, IT CAN BE REFERENCED ON PLANS**



**UNDERDRAIN CONNECTION  
TO CATCH BASINS**



**UNDERDRAIN AND  
BEDDING SECTION**



**DETAIL - A  
OPTIONAL SLIDE VALVE**

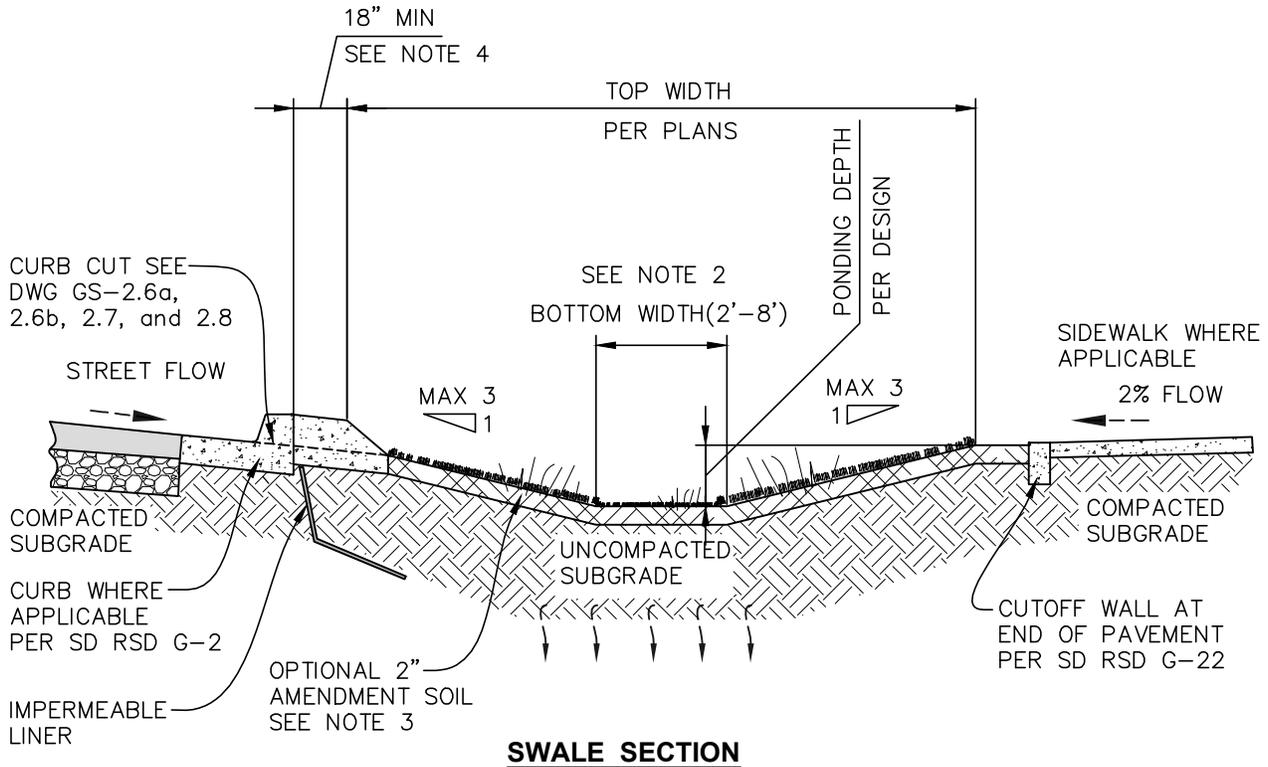
**NOTES:**

1. CATCH BASIN CONNECTIONS FROM UNDERDRAINS SERVICING PRIVATE PROPERTY ARE PROHIBITED.
2. WHEN STORMWATER FACILITY IS LOCATED > 10' FROM CATCH BASIN, PROVIDE ADDITIONAL CLEANOUT OUTSIDE OF STORMWATER FACILITY WITHIN 10' OF CATCH BASIN.
3. STORMWATER FACILITY DEPICTED IS RAIN GARDEN PRACTICE. CONNECTIONS TO CATCH BASIN WILL ALSO APPLY TO PERMEABLE PAVEMENTS AND SWALES WITH UNDERDRAINS.
4. OPTIONAL PVC GATE VALVE TO BE USED TO REGULATE FLOW IN UNDERDRAIN PIPE AS INDICATED IN PLANS. VALVE MAY ALSO BE USED IN OVERFLOW RISER AS DIRECTED.
5. PVC PIPE SLOPE SHALL BE PER PLAN.

DRAWING NOT TO SCALE

DRAWN BY: _____	CHECKED BY: _____	SAN DIEGO COUNTY DESIGN STANDARD	REVISIONS	APPROVED	DATE
RECOMMENDED BY: JEFF S. MOODY, P.E.					
APPROVED BY COUNTY ENGINEER		<b>STORMWATER FACILITY UNDERDRAIN BEDDING &amp; CATCH BASIN CONNECTION</b>			
DATE: _____					
DEYLAMIAN SIROUS, P.E. R.C.E. NO. 53192, EXP 6/30/2017			DRAWING NUMBER	<b>GS-6.3</b>	

**NOTE: THIS DRAWING IS TO BE INCLUDED ON PLANS UNTIL SIGNED BY THE COUNTY ENGINEER. ONCE SIGNED, IT CAN BE REFERENCED ON PLANS**



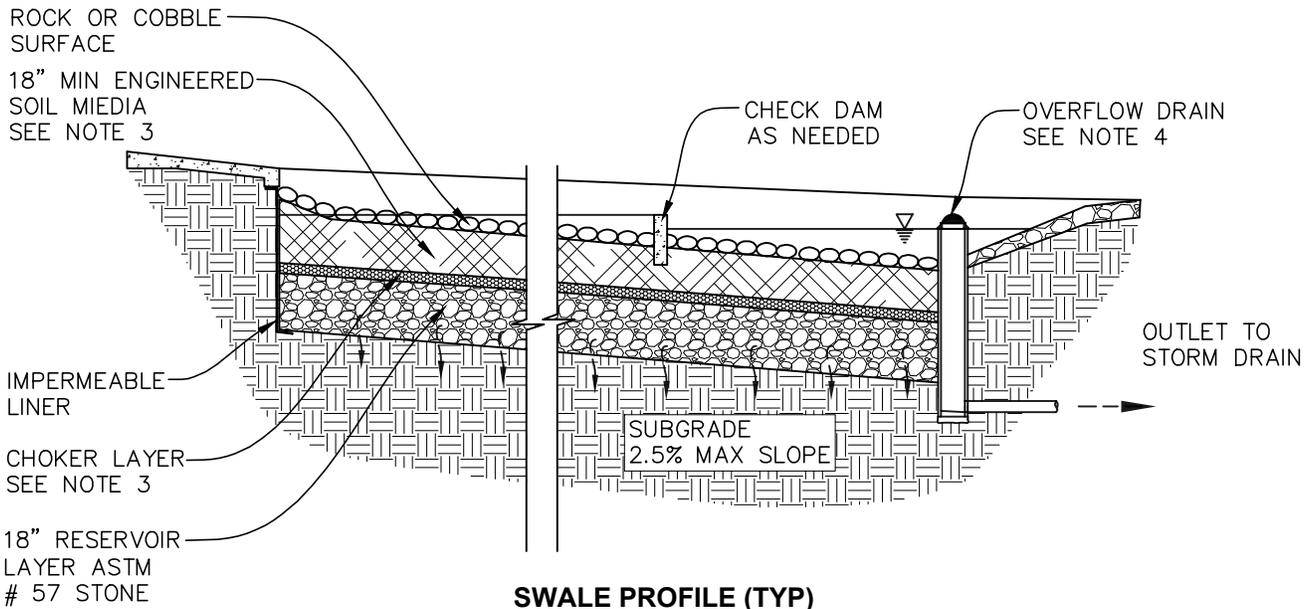
**NOTES:**

1. PROVIDE PROTECTION FROM ALL VEHICLE TRAFFIC, EQUIPMENT STAGING, AND FOOT TRAFFIC IN PROPOSED INFILTRATION AREAS PRIOR TO, DURING, AND AFTER CONSTRUCTION.
2. DIMENSIONS:
  - a. BOTTOM WIDTH: IF WIDER THAN 8', CHANNEL DIVIDERS MAY BE NECESSARY TO PREVENT MEANDERING AND LOW FLOW CHANNEL FORMATION.
  - b. FLOW DEPTH: WATER QUALITY DESIGN FLOW DEPTH NOT TO EXCEED TWO THIRDS THE HEIGHT OF THE VEGETATION FOR OPTIMUM WATER QUALITY TREATMENT.
  - c. LONGITUDINAL SLOPE: 1% TO 6% OVERALL SLOPE. SLOPES GREATER THAN 2.5% SHOULD INCORPORATE 6"-18" CHECK DAM TO MAINTAIN 2.5% MAX LONGITUDINAL INVERT SLOPE. MAXIMUM FLOW VELOCITY SHALL MEET REQUIREMENTS OF COUNTY HYDRAULIC DESIGN MANUAL.
3. OPTIONAL 2" SOIL AMENDMENT PER SWALE SOIL SPECIFICATION; MIX THE AMENDMENT INTO NATIVE SOILS TO A DEPTH OF 6" TO PREVENT SOIL LAYERING.
4. 18" MINIMUM CONCRETE STEP OUT REQUIRED WHEN PARKING IS ADJACENT TO CURB.

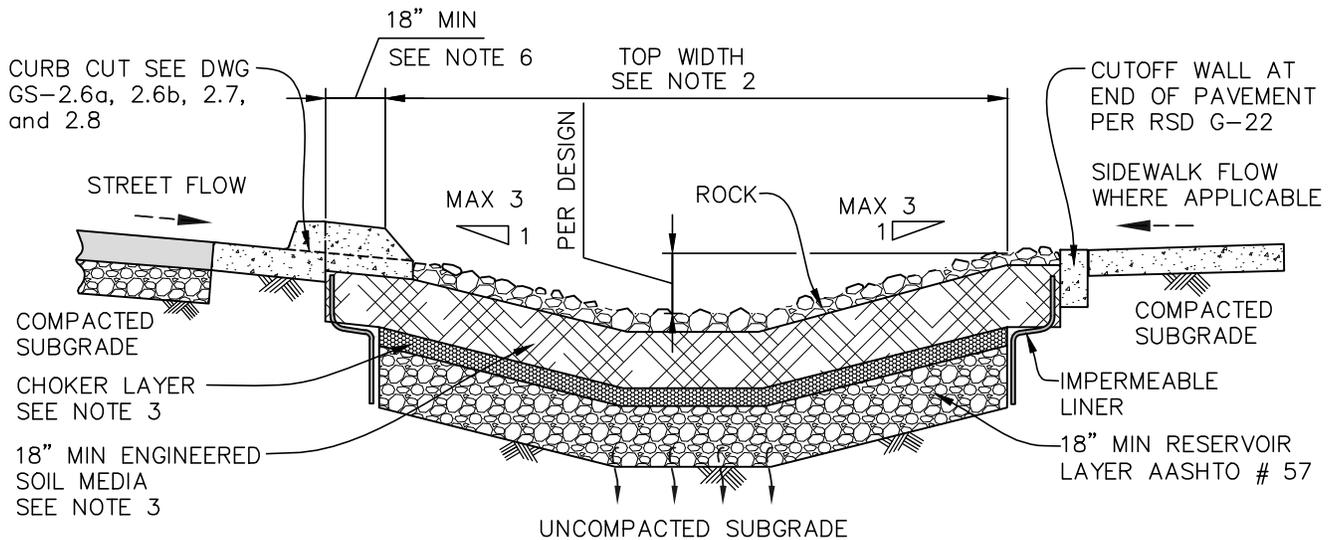
DRAWING NOT TO SCALE

DRAWN BY: _____	CHECKED BY: _____	SAN DIEGO COUNTY DESIGN STANDARD	REVISIONS	APPROVED	DATE
RECOMMENDED BY: JEFF S. MOODY, P.E.					
APPROVED BY COUNTY ENGINEER		<b>GREEN STREET VEGETATED SWALE WITH CURB</b>			
DATE: _____					
DEYLAMIAN SIROUS, P.E. R.C.E. NO. 53192, EXP 6/30/2017			DRAWING NUMBER	<b>GS-7.1</b>	

**NOTE: THIS DRAWING IS TO BE INCLUDED ON PLANS UNTIL SIGNED BY THE COUNTY ENGINEER. ONCE SIGNED, IT CAN BE REFERENCED ON PLANS**



**SWALE PROFILE (TYP)**



**SWALE SECTION (TYP)**

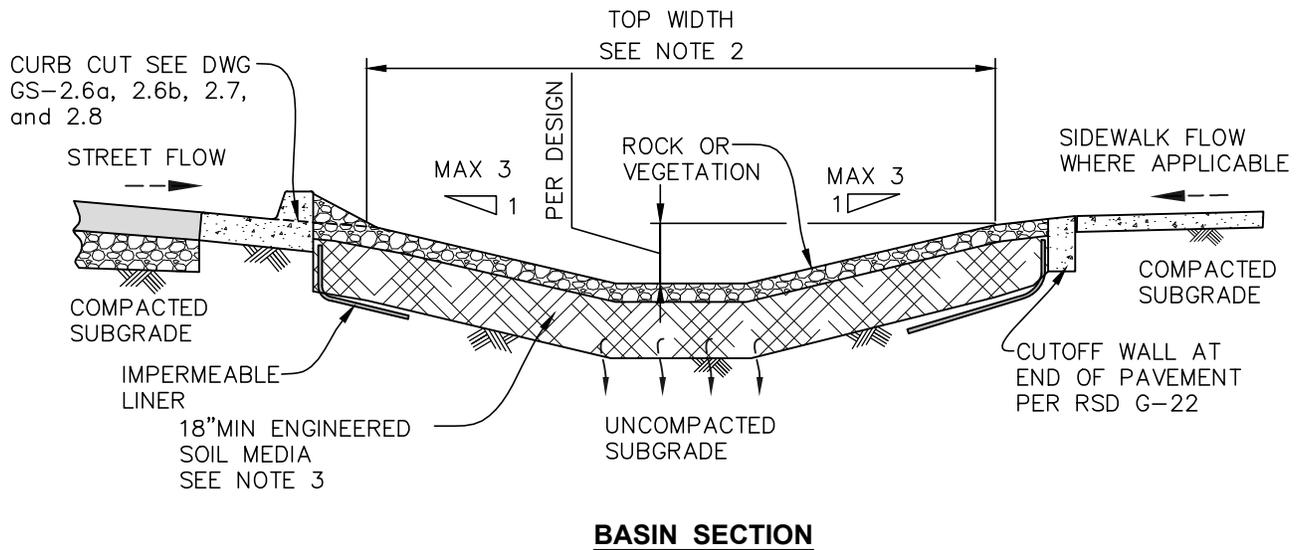
**NOTES:**

1. PROVIDE PROTECTION FROM ALL VEHICLE TRAFFIC, EQUIPMENT STAGING, AND FOOT TRAFFIC IN PROPOSED SWALE AREAS PRIOR TO, DURING, AND AFTER CONSTRUCTION.
2. DIMENSIONS:
  - a. WIDTH 4' MINIMUM.
  - b. DEPTH FROM TOP OF GROWING MEDIUM TO OVERFLOW ELEVATION; SIMPLIFIED: 6"-18".
  - c. LONGITUDINAL SLOPE OF SWALE: 2.5% MAX.
3. MATERIALS
  - a. ENGINEERED SOIL MEDIA: 65% SAND, 20% SANDY LOAM, 15% COMPOST (OR PER SPECIFICATIONS).
  - b. CHOKER LAYER: 2"-4" WASHED SAND OVER 2" CHOKING STONE.
4. OVERFLOW:
  - a. ALLOW FOR 2" OF FREEBOARD, MINIMUM.
  - b. PROTECT FROM DEBRIS AND SEDIMENT WITH STRAINER OR GRATE.
5. BOTTOM OF SWALE SHALL BE AT LEAST 10' ABOVE THE SEASONAL HIGH WATER TABLE OR 2' ABOVE BEDROCK, AS DETERMINED BY GEOTECHNICAL INVESTIGATION.
6. 18" MINIMUM CONCRETE STEP OUT ZONE REQUIRED WHEN PARKING IS ADJACENT TO CURB.

DRAWING NOT TO SCALE

DRAWN BY: _____	CHECKED BY: _____	SAN DIEGO COUNTY DESIGN STANDARD	REVISIONS	APPROVED	DATE
RECOMMENDED BY: JEFF S. MOODY, P.E.					
APPROVED BY COUNTY ENGINEER		<b>ROCK INFILTRATION SWALE</b>			
DATE: _____					
DEYLAMIAN SIROUS, P.E. R.C.E. NO. 53192, EXP 6/30/2017			DRAWING NUMBER	<b>GS-7.2</b>	

**NOTE: THIS DRAWING IS TO BE INCLUDED ON PLANS UNTIL SIGNED BY THE COUNTY ENGINEER. ONCE SIGNED, IT CAN BE REFERENCED ON PLANS**



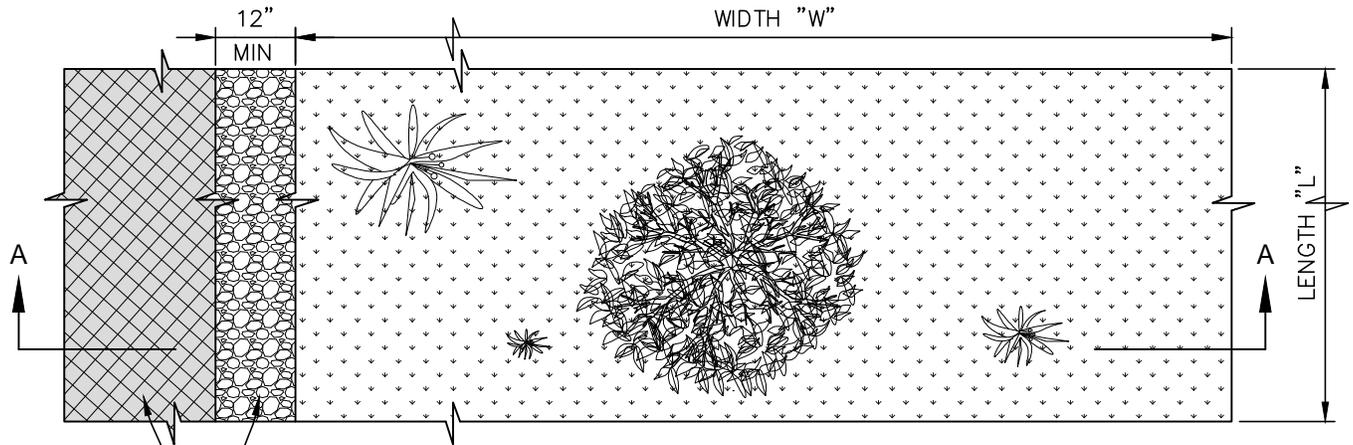
**NOTES:**

1. PROVIDE PROTECTION FROM ALL VEHICLE TRAFFIC, EQUIPMENT STAGING, AND FOOT TRAFFIC IN PROPOSED BASIN AREAS PRIOR TO, DURING, AND AFTER CONSTRUCTION.
2. DIMENSIONS:
  - a. WIDTH 4' MINIMUM.
  - b. DEPTH (FROM TOP OF GROWING MEDIUM TO OVERFLOW ELEVATION) 6"-18".
  - c. LONGITUDINAL SLOPE OF BASIN: FLAT
3. MATERIALS OF ENGINEERED SOIL MEDIA: 65% SAND, 20% SANDY LOAM, AND 15% COMPOST, OR PER SPECIFICATION
4. OVERFLOW:
  - a. ALLOW FOR 2" OF FREE BOARD, MINIMUM.
  - b. PROTECT FROM DEBRIS AND SEDIMENT WITH STRAINER OR GRATE.
5. BOTTOM OF BASIN SHALL BE AT LEAST 10' ABOVE THE SEASONAL HIGH WATER TABLE OR 2' ABOVE BEDROCK, AS DETERMINED BY GEOTECHNICAL INVESTIGATION.

DRAWING NOT TO SCALE

DRAWN BY: _____	CHECKED BY: _____	SAN DIEGO COUNTY DESIGN STANDARD	REVISIONS	APPROVED	DATE
RECOMMENDED BY: JEFF S. MOODY, P.E.					
APPROVED BY COUNTY ENGINEER		<b>RAIN GARDEN/ROCK GARDEN INFILTRATION</b>			
DATE: _____					
DEYLAMIAN SIROUS, P.E. R.C.E. NO. 53192, EXP 6/30/2017			DRAWING NUMBER	<b>GS-7.3</b>	

**NOTE: THIS DRAWING IS TO BE INCLUDED ON PLANS UNTIL SIGNED BY THE COUNTY ENGINEER. ONCE SIGNED, IT CAN BE REFERENCED ON PLANS**



IMPERVIOUS CONTRIBUTING DRAINAGE AREA

6" CRUSHED ROCK, OR GRAVEL TRENCH FLOW SPREADER OMIT WHEN ADJACENT TO TRAVELED WAY

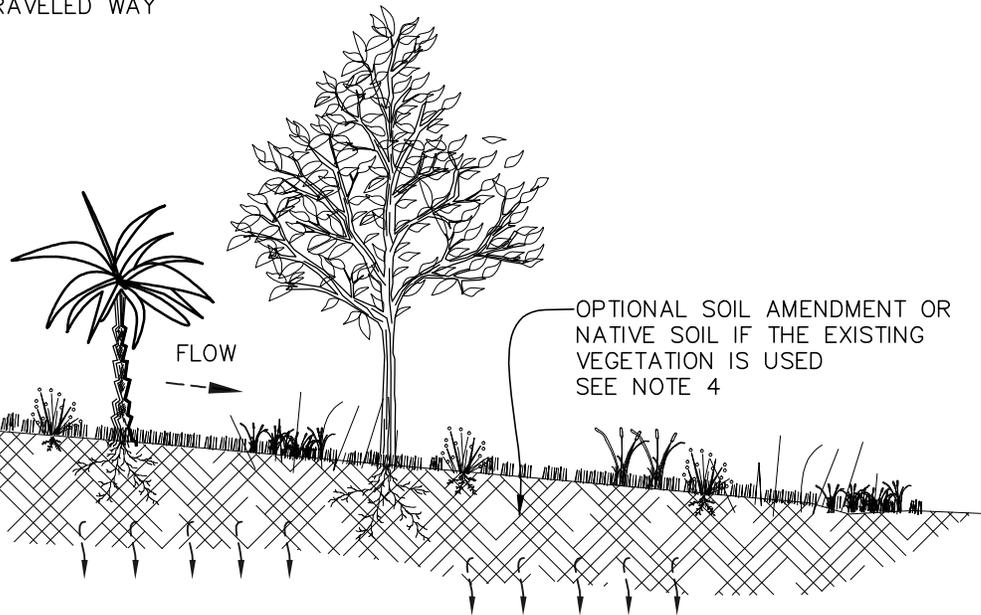
**PLAN VIEW**

CUTOFF WALL AT END OF PAVEMENT PER RSD G-22

IMPERVIOUS CONTRIBUTING DRAINAGE AREA

IMPERMEABLE LINER

6" CRUSHED ROCK, OR GRAVEL TRENCH FLOW SPREADER OMIT WHEN ADJACENT TO TRAVELED WAY



OPTIONAL SOIL AMENDMENT OR NATIVE SOIL IF THE EXISTING VEGETATION IS USED SEE NOTE 4

**SECTION A-A**

**NOTES:**

1. PROVIDE PROTECTION FROM ALL VEHICLE TRAFFIC, EQUIPMENT STAGING, AND FOOT TRAFFIC IN PROPOSED INFILTRATION AREAS PRIOR TO, DURING, AND AFTER CONSTRUCTION.
2. DIMENSIONS:
  - a. WIDTH: 15' MIN (SHOULD ALLOW FOR 10 MINUTES HYDRAULIC RESIDENCE TIME).
  - b. SLOPES: 5% MAXIMUM.
  - c. FLOW DEPTH: 1" MAXIMUM.
3. VEGETATION COVER MAINTAINED AT HEIGHT OF 4" MINIMUM.
4. OPTIONAL 2" SOIL AMENDMENT PER PROJECT SOIL SPECIFICATIONS. MIX THE AMENDMENT INTO NATIVE SOIL TO A DEPTH OF 6" TO PREVENT SOIL LAYERING.

DRAWING NOT TO SCALE

DRAWN BY: _____	CHECKED BY: _____	SAN DIEGO COUNTY DESIGN STANDARD	REVISIONS	APPROVED	DATE
RECOMMENDED BY: JEFF S. MOODY, P.E.					
APPROVED BY COUNTY ENGINEER		<b>VEGETATED FILTER STRIP</b>			
DATE: _____					
DEYLAMIAN SIROUS, P.E. R.C.E. NO. 53192, EXP 6/30/2017			DRAWING NUMBER <b>GS-7.4</b>		

**NOTE: THIS DRAWING IS TO BE INCLUDED ON PLANS UNTIL SIGNED BY THE COUNTY ENGINEER. ONCE SIGNED, IT CAN BE REFERENCED ON PLANS**

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