

**DESIGN NOTES**

1. FOR PUBLIC PROJECTS, ALL ELEMENTS MUST BE WITHIN THE RIGHT OF WAY OR APPROPRIATE EASEMENTS.
2. NO PRIVATE SYSTEMS SHALL BE PLACED IN THE PUBLIC RIGHT OF WAY.
3. ALL DIMENSIONS CAN BE MODIFIED TO FIT SITE CONSTRAINTS; WIDTHS LESS THAN 2' ARE NOT RECOMMENDED. MODIFICATIONS MUST BE DESIGNED BY LICENSED ENGINEER.
4. COMPACTED BASE TO 95% MIN. MODIFIED PROCTOR, 98% MAX. MODIFIED PROCTOR.
5. ANY TYPE D CURB MODIFICATIONS TO BE DESIGNED BY ENGINEER.
6. DRAINAGE INLET SLOT AND SPACING AS WELL AS OVERFLOW TO BE DESIGNED BY ENGINEER. TRAPEZOIDAL CURB OPENINGS ARE RECOMMENDED TO AVOID CLOGGING.
7. BIORETENTION SOIL MIX (BSM) SHOULD CONSIST OF 30-40% COMPOST BY VOLUME AND 60-70% SAND. SEE BSM AND BAM TECHNICAL SPECIFICATIONS.
8. HARDWOOD MULCH MATERIAL MUST BE USED PER PINELLAS COUNTY STORMWATER MANUAL SPECIFICATIONS.
9. VEGETATED SYSTEMS MUST BE ABLE TO RECOVER REQUIRED TREATMENT VOLUME IN 24 TO 36 HOURS TO PREVENT DAMAGE TO VEGETATION.
10. REQUIRED MIN. DISTANCE OF 24" FROM BOTTOM OF GREEN GUTTER TO SEASONAL HIGH GROUNDWATER TABLE (SHGWT).
11. UNDERDRAIN SYSTEM REQUIRED IF THE SEASONAL HIGH GROUNDWATER TABLE IS LESS THAN 24" BELOW THE BOTTOM OF THE ENGINEERED SOIL/BAM LAYER OR IF NATIVE SOIL INFILTRATION DOES NOT FACILITATE ADEQUATE INFILTRATION. UNDERDRAIN TO BE DESIGNED BY ENGINEER PER PINELLAS COUNTY DETAIL INDEX NUMBER 1290.
12. MINIMUM UTILITY SETBACKS AND PROTECTION MEASURES MUST CONFORM TO CURRENT PINELLAS COUNTY STANDARDS. COORDINATE WITH UTILITY OWNER IN THE EVENT OF UTILITY CROSSING AND UTILITY CONFLICTS.
13. DESIGN ENGINEER MUST ENSURE FINAL DESIGN ADHERES TO ALL APPLICABLE COUNTY CODES.

**PINELLAS COUNTY**

GREEN GUTTERS

FIGURE I.D.:

4.4.3

DATE: MAY/2021

**NOT TO SCALE**

REVISION:

DESIGN NOTES

1. GREEN GUTTER PLANTINGS:
  - a. GREEN GUTTERS SHOULD BE POPULATED WITH PLANTS NATIVE TO THE INSTALLATION LOCATION. NATIVE PLANTS, GRASSES AND FLOWERS ESTABLISH DEEPER ROOTS AND REMOVE MORE POLLUTANTS FROM RUNOFF.
  - b. SELECT A MIXTURE OF NATIVE PLANTS BASED ON SITE CONDITIONS TO IMPROVE BIODIVERSITY AND AESTHETICS. SELECTED PLANTS SHOULD BE DROUGHT AND FLOOD TOLERANT. RECOMMENDED APPROACH INCLUDES 1/3 SEDGES, 1/3 FLOWERS, AND 1/3 GRASSES.
2. SCHEDULE PRE-INSTALLATION MEETING WITH THE DESIGN ENGINEER 72 HOURS IN ADVANCE OF GREEN INFRASTRUCTURE CONSTRUCTION.
3. VEGETATED SYSTEMS MUST BE ABLE TO RECOVER REQUIRED TREATMENT VOLUME IN 24 TO 36 HOURS TO PREVENT DAMAGE TO VEGETATION WITH A DESIGN SAFETY FACTOR OF 2.0.
4. AREAS IN AND AROUND GREEN INFRASTRUCTURE SHOULD BE PROTECTED DURING EARTH MOVING TO PREVENT COMPACTION THAT WOULD REDUCE INFILTRATION RATES. PROTECTION THROUGHOUT CONSTRUCTION FROM SEDIMENT TRANSPORT THAT WOULD CLOG THE INFILTRATION CAPACITY OF NATIVE AND ENGINEERED SOILS.
5. CONTRACTOR SHOULD RAKE OR ROTOTILL THE TOP SIX INCHES OF NATIVE SOIL AFTER EXCAVATION WHERE INFILTRATION WILL TAKE PLACE TO COUNTERACT THE EFFECTS OF COMPACTION AND CLOGGING.
6. MINIMIZE NATIVE SOIL DISTURBANCE WHILE INSTALLING OVERFLOW STRUCTURE.

BIORETENTION SOIL MIX (BSM) AND BIOSORPTION ACTIVATED MEDIA (BAM) SPECIFICATION

1. BSM WILL ADHERE TO THE FOLLOWING:
  - a. 30-40% COMPOST AND 60-70% SAND BY VOLUME. SEE BIORETENTION MEDIA TECHNICAL SPECIFICATIONS.
  - b. ORGANIC CONTENT MATTER FROM 4-8% BY WEIGHT
  - c. COMPACT TO 85% MAXIMUM DENSITY PER ASTM D 1557
  - d. MINIMUM LONG-TERM HYDRAULIC CONDUCTIVITY OF 5 INCH/HOUR PER ASTM D2434.
  - e. MAXIMUM IMMEDIATE HYDRAULIC CONDUCTIVITY OF 12 INCHES/HOUR
2. BSM SHOULD BE MIXED UNIFORMLY AND ONSITE CHARACTERISTICS SHOULD BE VERIFIED BY MATERIALS TESTING PRIOR TO PLACEMENT.
3. PLACE UNSATURATED BSM IN 8 INCH LIFTS. DO NOT PLACE IF SATURATED.
4. TO PRESERVE INFILTRATION CAPACITY OF NATIVE SOIL, KEEP MACHINERY OUTSIDE OF GREEN INFRASTRUCTURE AREA.
5. AFTER PLACEMENT, COMPACT EACH LIFT TO 85% MAXIMUM DENSITY USING WATER UNTIL SATURATED. DO NOT USE A VIBRATORY COMPACTOR.

MAINTENANCE GUIDELINES

1. WATER PLANTS THOROUGHLY FOLLOWING PLANTING TO SETTLE THE SOIL AROUND THE ROOTS UNTIL ESTABLISHMENT HAS TAKEN PLACE.
2. REMOVE DEBRIS AND RUBBISH ON A MONTHLY BASIS.
3. PERFORM SPRING MAINTENANCE TO REMOVE BUILT UP DEBRIS FROM WINTER, PROVIDE PRE-EMERGENT PLANT CARE AND INSTALL/REPLACE MULCH AS NECESSARY.
4. TRIM VEGETATION TO ENSURE SAFETY, AESTHETICS, PROPER OPERATION, OR TO SUPPRESS WEEDS AND INVASIVE VEGETATION.
5. CUT BACK PERENNIALS AND REMOVE LEAF DEBRIS AT END OF GROWING SEASON.
6. REPLACE UNSUCCESSFULLY ESTABLISHED PLANTS
7. INSPECT AND CORRECT EROSION PROBLEMS, DAMAGE TO VEGETATION, SEDIMENT AND DEBRIS ACCUMULATION AND POOLS OF STANDING WATER.
8. REMOVE ALL LABELS, WIRES, ETC, FROM PLANTS

**PINELLAS COUNTY**

GREEN GUTTER NOTES

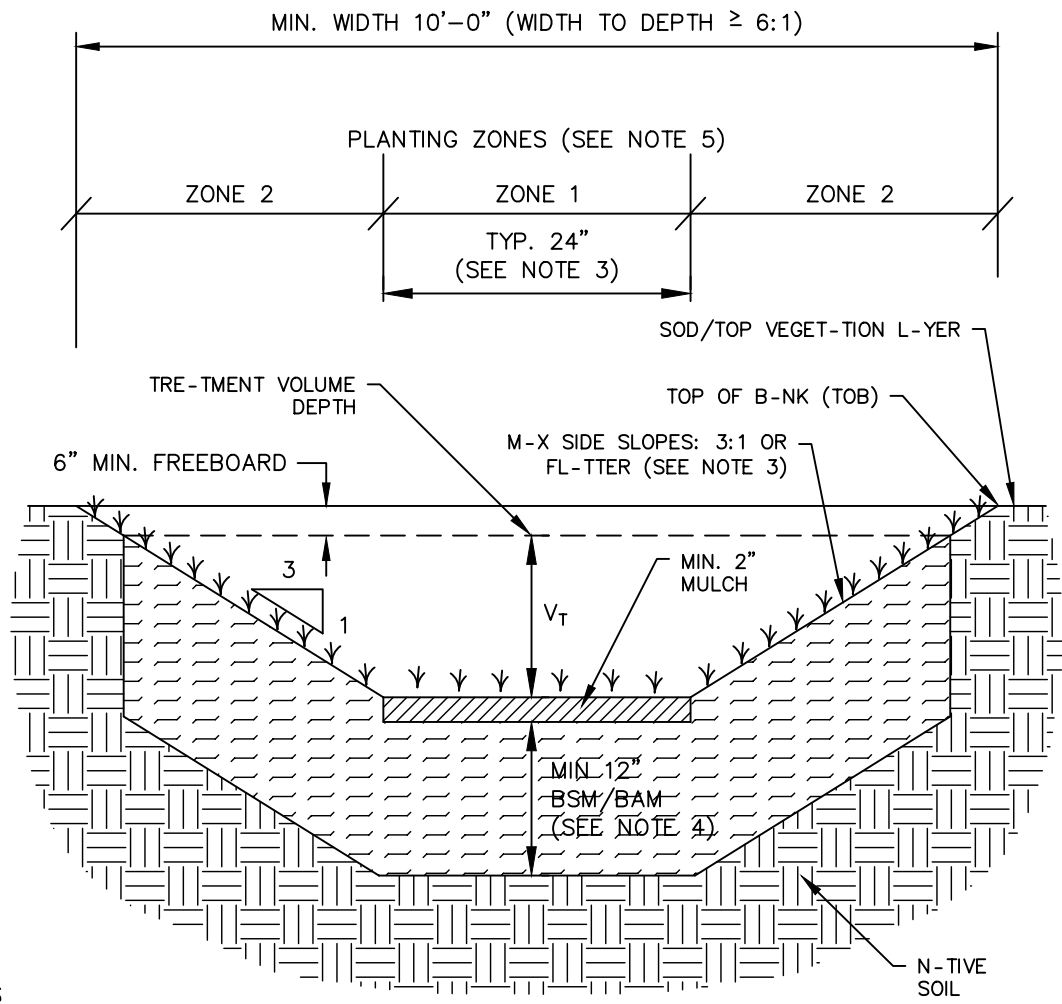
FIGURE I.D.:

4.4.3 NOTES

DATE: MAY/2021

NOT TO SCALE

REVISION:



DESIGN NOTES

1. FOR PUBLIC PROJECTS, ALL ELEMENTS MUST BE WITHIN THE RIGHT OF WAY OR APPROPRIATE EASEMENTS.
2. NO PRIVATE SYSTEMS SHALL BE PLACED IN THE PUBLIC RIGHT OF WAY.
3. ALL DIMENSIONS CAN BE MODIFIED TO FIT SITE CONSTRAINTS; WIDTHS LESS THAN 2' ARE NOT RECOMMENDED. MODIFICATIONS MUST BE DESIGNED BY LICENSED ENGINEER. SIDE SLOPES STEEPER THAN 3:1 (H:V) REQUIRE REINFORCEMENT OF SIDEWALLS.
4. BIORETENTION SOIL MIX (BSM) SHOULD CONSIST OF 30-40% COMPOST AND 60-70% SAND BY VOLUME. SEE BSM AND BAM SPECIFICATIONS.
5. REFER TO LIST OF COUNTY APPROVED PLANTINGS AND SPEC SHEET FOR PLANTING DESIGN AND MAINTENANCE INFORMATION.
6. VEGETATED SYSTEMS MUST BE ABLE TO RECOVER REQUIRED TREATMENT VOLUME IN 24 TO 36 HOURS TO PREVENT DAMAGE TO VEGETATION.
7. HARDWOOD MULCH MATERIAL MUST BE USED PER PINELLAS COUNTY STORMWATER MANUAL SPECIFICATIONS.
8. BIOSWALE LENGTHS AND DEPTH CAN VARY TO ACHIEVE TREATMENT VOLUME;  $V_T$ .
9. POSITIVE OUTFALL REQUIRED TO BE DESIGNED BY ENGINEER. DESIGN LONGITUDINAL SLOPES SHALL NOT CAUSE EROSION.
10. REQUIRED MIN. DISTANCE OF 12" FROM BOTTOM OF BIOSWALE TO SEASONAL HIGH GROUNDWATER TABLE (SHGWT).
11. UNDERDRAIN SYSTEM REQUIRED IF THE SEASONAL HIGH GROUNDWATER TABLE IS LESS THAN 12" BELOW THE BOTTOM OF THE ENGINEERED SOIL/BAM LAYER OR IF NATIVE SOIL INFILTRATION DOES NOT FACILITATE ADEQUATE INFILTRATION. UNDERDRAIN TO BE DESIGNED BY ENGINEER PER PINELLAS COUNTY DETAIL INDEX NUMBER 1290.
12. MINIMUM UTILITY SETBACKS AND PROTECTION MEASURES MUST CONFORM TO CURRENT PINELLAS COUNTY STANDARDS. COORDINATE WITH UTILITY OWNER IN THE EVENT OF UTILITY CROSSING AND UTILITY CONFLICTS.
13. DESIGN ENGINEER MUST ENSURE FINAL DESIGN ADHERES TO ALL APPLICABLE COUNTY CODES.

**PINELLAS COUNTY**

BIO-SWALES

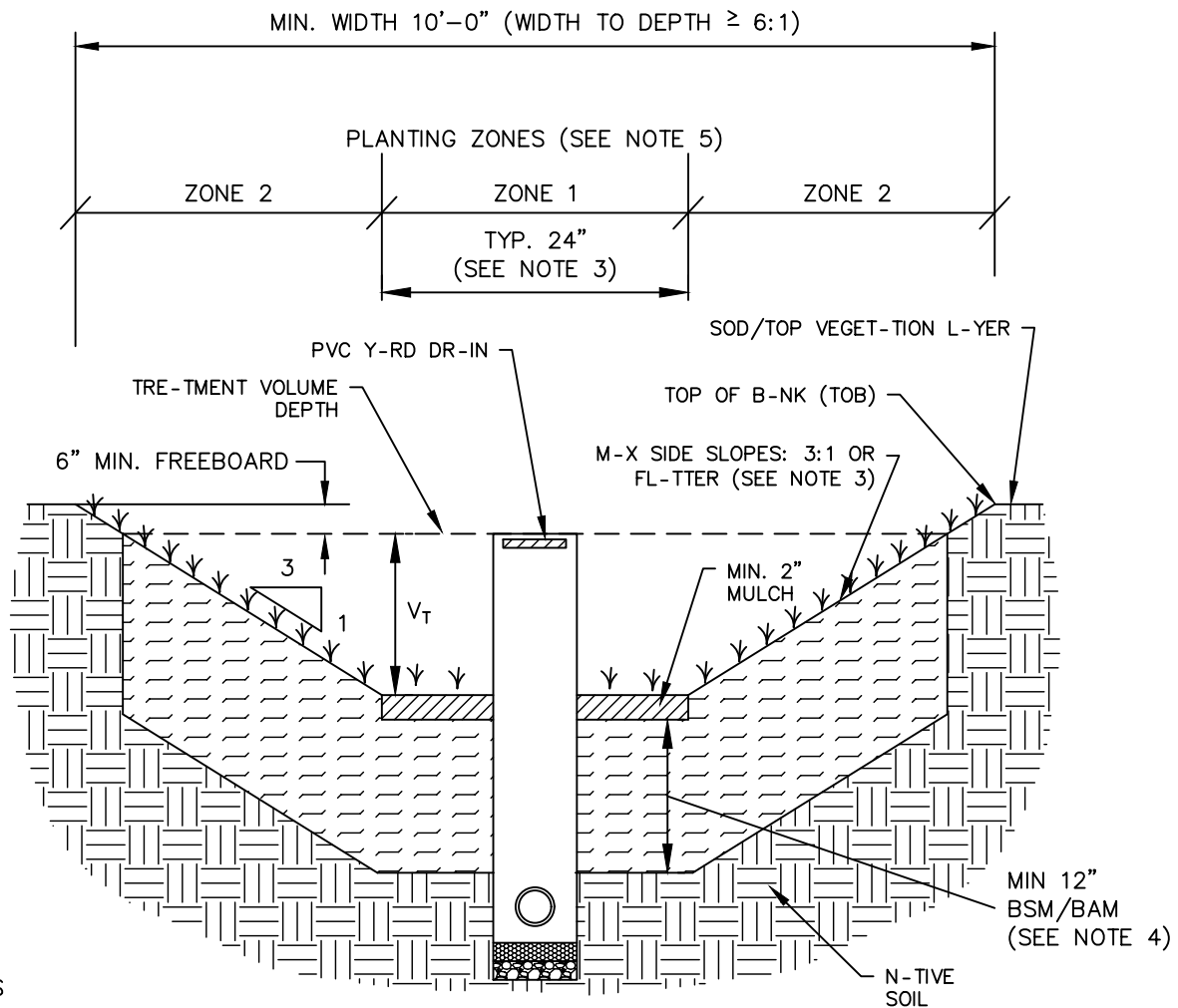
FIGURE I.D.:

4.4.1

DATE: MAY/2021

NOT TO SCALE

REVISION:



DESIGN NOTES

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**PINELLAS COUNTY**

BIO-SWALES

EXAMPLE PLACEMENT OF POSITIVE OUTFALL

FIGURE I.D.:

4.4.2

DATE: MAY/2021

NOT TO SCALE

REVISION:

DESIGN NOTES

1. BIOSWALE PLANTINGS:
  - a. THE BIOSWALE SHOULD BE POPULATED WITH PLANTS NATIVE TO THE INSTALLATION LOCATION. NATIVE PLANTS, GRASSES AND FLOWERS ESTABLISH DEEPER ROOTS AND REMOVE MORE POLLUTANTS FROM RUNOFF.
  - b. SELECT A MIXTURE OF NATIVE PLANTS BASED ON SITE CONDITIONS TO IMPROVE BIODIVERSITY AND AESTHETICS. SELECTED PLANTS SHOULD BE DROUGHT AND FLOOD TOLERANT. RECOMMENDED APPROACH INCLUDES 1/3 SEDGES, 1/3 FLOWERS, AND 1/3 GRASSES.
  - c. REFER TO PINELLAS COUNTY STORMWATER MANUAL FOR PLANTING PALETTE AND PLANTING ZONE GUIDANCE.
2. SCHEDULE PRE-INSTALLATION MEETING WITH THE DESIGN ENGINEER 72 HOURS IN ADVANCE OF GREEN INFRASTRUCTURE CONSTRUCTION.
3. AREAS IN AND AROUND GREEN INFRASTRUCTURE SHOULD BE PROTECTED DURING EARTH MOVING TO PREVENT COMPACTION THAT WOULD REDUCE INFILTRATION RATES. PROTECTION THROUGHOUT CONSTRUCTION FROM SEDIMENT TRANSPORT THAT WOULD CLOG THE INFILTRATION CAPACITY OF NATIVE AND ENGINEERED SOILS.
4. VEGETATED SYSTEMS MUST BE ABLE TO RECOVER REQUIRED TREATMENT VOLUME IN 24 TO 36 HOURS TO PREVENT DAMAGE TO VEGETATION WITH A DESIGN SAFETY FACTOR OF 2.0.
5. CONTRACTOR SHOULD RAKE OR ROTOTILL THE TOP SIX INCHES OF NATIVE SOIL AFTER EXCAVATION WHERE INFILTRATION WILL TAKE PLACE TO COUNTERACT THE EFFECTS OF COMPACTION AND CLOGGING.
6. MINIMIZE NATIVE SOIL DISTURBANCE WHILE INSTALLING OVERFLOW STRUCTURE.
7. LONGITUDINAL SLOPE OF SWALE SHOULD BE BETWEEN 0.5% AND 2.5%, IF AN UNDERDRAIN IS INCLUDED IN THE PROJECT, THE SURFACE OF THE BSM/BAM LAYER CAN BE FLAT.

BIORETENTION SOIL MIX (BSM) AND BIOSORPTION ACTIVATED MEDIA (BAM) SPECIFICATION

1. BSM WILL ADHERE TO THE FOLLOWING:
  - a. 30-40% COMPOST AND 60-70% SAND BY VOLUME. SEE BIORETENTION MEDIA TECHNICAL SPECIFICATIONS.
  - b. ORGANIC CONTENT MATTER FROM 4-8% BY WEIGHT
  - c. COMPACT TO 85% MAXIMUM DENSITY PER ASTM D 1557
  - d. MINIMUM LONG-TERM HYDRAULIC CONDUCTIVITY OF 5 INCH/HOUR PER ASTM D2434.
  - e. MAXIMUM IMMEDIATE HYDRAULIC CONDUCTIVITY OF 12 INCHES/HOUR
2. BSM SHOULD BE MIXED UNIFORMLY AND ONSITE CHARACTERISTICS SHOULD BE VERIFIED BY MATERIALS TESTING PRIOR TO PLACEMENT.
3. PLACE UNSATURATED BSM IN 8 INCH LIFTS. DO NOT PLACE IF SATURATED.
4. TO PRESERVE INFILTRATION CAPACITY OF NATIVE SOIL, KEEP MACHINERY OUTSIDE OF GREEN INFRASTRUCTURE AREA.
5. AFTER PLACEMENT, COMPACT EACH LIFT TO 85% MAXIMUM DENSITY USING WATER UNTIL SATURATED. DO NOT USE A VIBRATORY COMPACTOR.

MAINTENANCE GUIDELINES

1. WATER PLANTS THOROUGHLY FOLLOWING PLANTING TO SETTLE THE SOIL AROUND THE ROOTS UNTIL ESTABLISHMENT HAS TAKEN PLACE.
2. REMOVE DEBRIS AND RUBBISH ON A MONTHLY BASIS.
3. PERFORM SPRING MAINTENANCE TO REMOVE BUILT UP DEBRIS FROM WINTER, PROVIDE PRE-EMERGENT PLANT CARE AND INSTALL/REPLACE MULCH AS NECESSARY.
4. TRIM VEGETATION TO ENSURE SAFETY, AESTHETICS, PROPER OPERATION, OR TO SUPPRESS WEEDS AND INVASIVE VEGETATION.
5. CUT BACK PERENNIALS AND REMOVE LEAF DEBRIS AT END OF GROWING SEASON.
6. INSPECT AND CORRECT EROSION PROBLEMS, DAMAGE TO VEGETATION, SEDIMENT AND DEBRIS ACCUMULATION AND POOLS OF STANDING WATER.
7. INSPECT FOR UNIFORMITY IN CROSS-SECTION AND LONGITUDINAL SLOPE, CORRECT AS NEEDED.
8. REMOVE ALL LABELS, WIRES, ETC, FROM PLANTS

**PINELLAS COUNTY**

BIO-SWALE NOTES

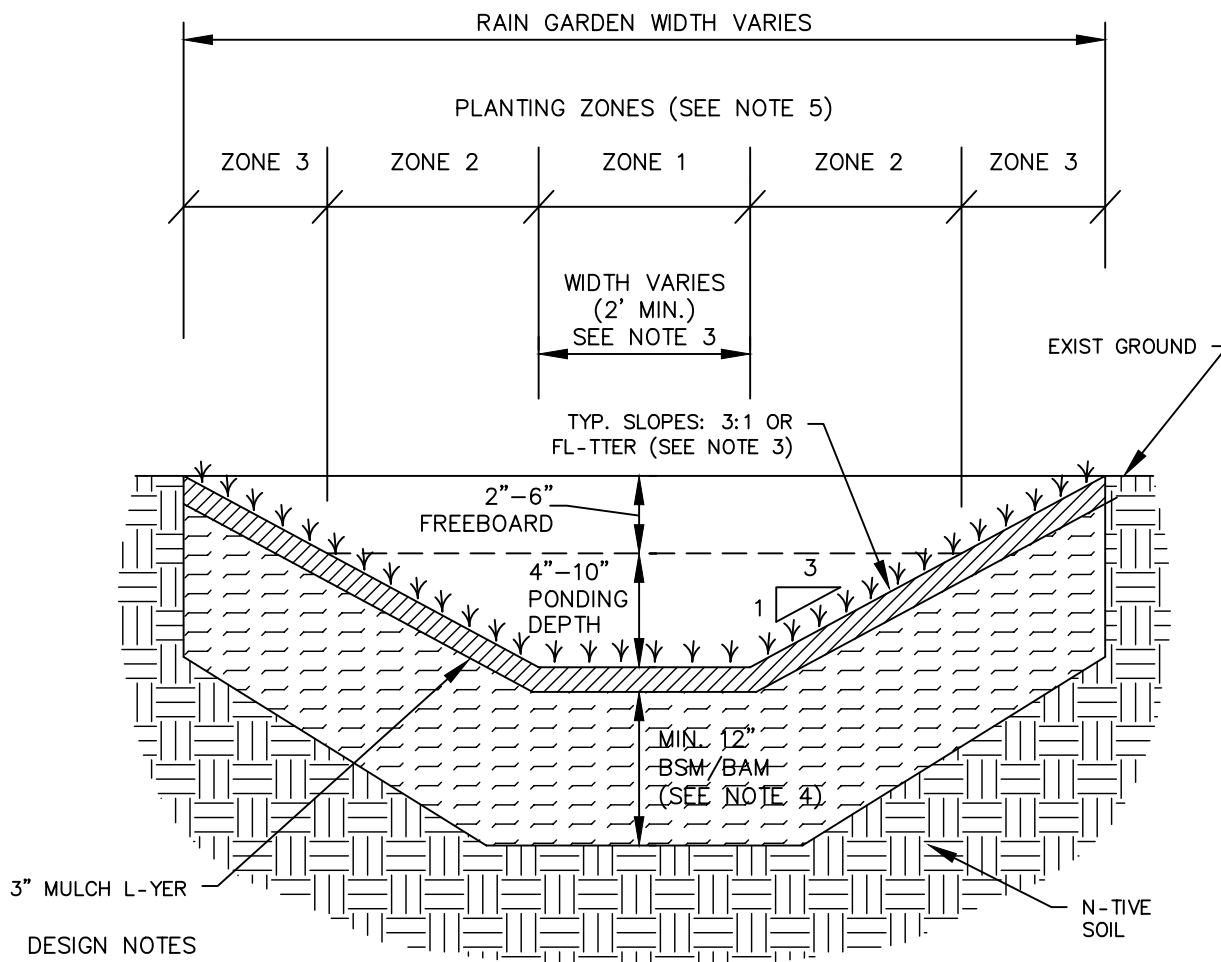
FIGURE I.D.:

4.4.2 NOTES

DATE: **MAY/2021**

**NOT TO SCALE**

REVISION:



**DESIGN NOTES**

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4. BIORETENTION SOIL MIX (BSM) SHOULD CONSIST OF 30-40% COMPOST AND 60-70% SAND BY VOLUME. SEE BSM AND BAM SPECIFICATIONS.
5. REFER TO LIST OF COUNTY APPROVED PLANTINGS AND SPEC SHEET FOR PLANTING DESIGN AND MAINTENANCE INFORMATION.
6. VEGETATED SYSTEMS MUST BE ABLE TO RECOVER REQUIRED TREATMENT VOLUME IN 24 TO 36 HOURS TO PREVENT DAMAGE TO VEGETATION.
7. HARDWOOD MULCH MATERIAL MUST BE USED PER PINELLAS COUNTY STORMWATER MANUAL SPECIFICATIONS.
8. REQUIRED MIN. DISTANCE OF 12" FROM BOTTOM OF RAIN GARDEN TO SEASONAL HIGH GROUNDWATER TABLE (SHGWT).
9. UNDERDRAIN REQUIRED IF THE SHGWT IS WITHIN 12" FROM THE RAIN GARDEN BOTTOM OR IF THE NATIVE SOIL INFILTRATION DOES NOT ALLOW ADEQUATE INFILTRATION. UNDERDRAIN TO BE DESIGNED BY ENGINEER PER PINELLAS COUNTY DETAIL INDEX NUMBER 1290.
10. FINAL DESIGN MUST INCLUDE A POSITIVE OUTFALL STRUCTURE.
11. A DRAW-DOWN ANALYSES SHOULD ACCOMPANY RAIN GARDEN DESIGN DETAILS TO ENSURE ADEQUATE HYDRAULIC BEHAVIOR.
12. MINIMUM UTILITY SETBACKS AND PROTECTION MEASURES MUST CONFORM TO CURRENT PINELLAS COUNTY STANDARDS. COORDINATE WITH UTILITY OWNER IN THE EVENT OF UTILITY CROSSING AND UTILITY CONFLICTS.
13. DESIGN ENGINEER MUST ENSURE FINAL DESIGN ADHERES TO ALL APPLICABLE COUNTY CODES.

**PINELLAS COUNTY**

**RAIN GARDEN TEMPLATE**

FIGURE I.D.:

4.13.1

DATE:

MAY/2021

**NOT TO SCALE**

REVISION:

DESIGN NOTES

1. RAIN GARDEN PLANTINGS:
  - a. THE RAIN GARDEN SHOULD BE POPULATED WITH PLANTS NATIVE TO THE INSTALLATION LOCATION. NATIVE PLANTS, GRASSES AND FLOWERS ESTABLISH DEEPER ROOTS AND REMOVE MORE POLLUTANTS FROM RUNOFF.
  - b. SELECT A MIXTURE OF NATIVE PLANTS BASED ON SITE CONDITIONS TO IMPROVE BIODIVERSITY AND AESTHETICS. SELECTED PLANTS SHOULD BE DROUGHT AND FLOOD TOLERANT. RECOMMENDED APPROACH INCLUDES 1/3 SEDGES, 1/3 FLOWERS, AND 1/3 GRASSES.
  - c. REFER TO PINELLAS COUNTY STORMWATER MANUAL FOR PLANTING PALLETTE AND PLANTING ZONE GUIDANCE.
2. SCHEDULE PRE-INSTALLATION MEETING WITH THE DESIGN ENGINEER 72 HOURS IN ADVANCE OF GREEN INFRASTRUCTURE CONSTRUCTION.
3. AREAS IN AND AROUND GREEN INFRASTRUCTURE SHOULD BE PROTECTED DURING EARTH MOVING TO PREVENT COMPACTION THAT WOULD REDUCE INFILTRATION RATES. PROTECTION THROUGHOUT CONSTRUCTION FROM SEDIMENT TRANSPORT THAT WOULD CLOG THE INFILTRATION CAPACITY OF NATIVE AND ENGINEERED SOILS.
4. VEGETATED SYSTEMS MUST BE ABLE TO RECOVER REQUIRED TREATMENT VOLUME IN 24 TO 36 HOURS TO PREVENT DAMAGE TO VEGETATION WITH A DESIGN SAFETY FACTOR OF 2.0.
5. CONTRACTOR SHOULD RAKE OR ROTOTILL THE TOP SIX INCHES OF NATIVE SOIL AFTER EXCAVATION WHERE INFILTRATION WILL TAKE PLACE TO COUNTERACT THE EFFECTS OF COMPACTION AND CLOGGING.
6. MINIMIZE NATIVE SOIL DISTURBANCE WHILE INSTALLING OVERFLOW STRUCTURE.

BIORETENTION SOIL MIX (BSM) AND BIOSORPTION ACTIVATED MEDIA (BAM) SPECIFICATION

1. BSM WILL ADHERE TO THE FOLLOWING:
  - a. 30-40% COMPOST AND 60-70% SAND BY VOLUME. SEE BIORETENTION MEDIA TECHNICAL SPECIFICATIONS.
  - b. ORGANIC CONTENT MATTER FROM 4-8% BY WEIGHT
  - c. COMPACT TO 85% MAXIMUM DENSITY PER ASTM D 1557
  - d. MINIMUM LONG-TERM HYDRAULIC CONDUCTIVITY OF 5 INCH/HOUR PER ASTM D2434.
  - e. MAXIMUM IMMEDIATE HYDRAULIC CONDUCTIVITY OF 12 INCHES/HOUR
2. BSM SHOULD BE MIXED UNIFORMLY AND ONSITE CHARACTERISTICS SHOULD BE VERIFIED BY MATERIALS TESTING PRIOR TO PLACEMENT.
3. PLACE UNSATURATED BSM IN 8 INCH LIFTS. DO NOT PLACE IF SATURATED.
4. TO PRESERVE INFILTRATION CAPACITY OF NATIVE SOIL, KEEP MACHINERY OUTSIDE OF GREEN INFRASTRUCTURE AREA.
5. AFTER PLACEMENT, COMPACT EACH LIFT TO 85% MAXIMUM DENSITY USING WATER UNTIL SATURATED. DO NOT USE A VIBRATORY COMPACTOR.

MAINTENANCE GUIDELINES

1. WATER PLANTS THOROUGHLY FOLLOWING PLANTING TO SETTLE THE SOIL AROUND THE ROOTS UNTIL ESTABLISHMENT HAS TAKEN PLACE.
2. REMOVE DEBRIS AND RUBBISH ON A MONTHLY BASIS.
3. PERFORM SPRING MAINTENANCE TO REMOVE BUILT UP DEBRIS FROM WINTER, PROVIDE PRE-EMERGENT PLANT CARE AND INSTALL/REPLACE MULCH AS NECESSARY.
4. TRIM VEGETATION TO ENSURE SAFETY, AESTHETICS, PROPER OPERATION, OR TO SUPPRESS WEEDS AND INVASIVE VEGETATION.
5. CUT BACK PERENNIALS AND REMOVE LEAF DEBRIS AT END OF GROWING SEASON.
6. REPLACE UNSUCCESSFULLY ESTABLISHED PLANTS
7. INSPECT AND CORRECT EROSION PROBLEMS, DAMAGE TO VEGETATION, SEDIMENT AND DEBRIS ACCUMULATION AND POOLS OF STANDING WATER.
8. REMOVE ALL LABELS, WIRES, ETC, FROM PLANTS

**PINELLAS COUNTY**

RAIN GARDEN NOTES

FIGURE I.D.:

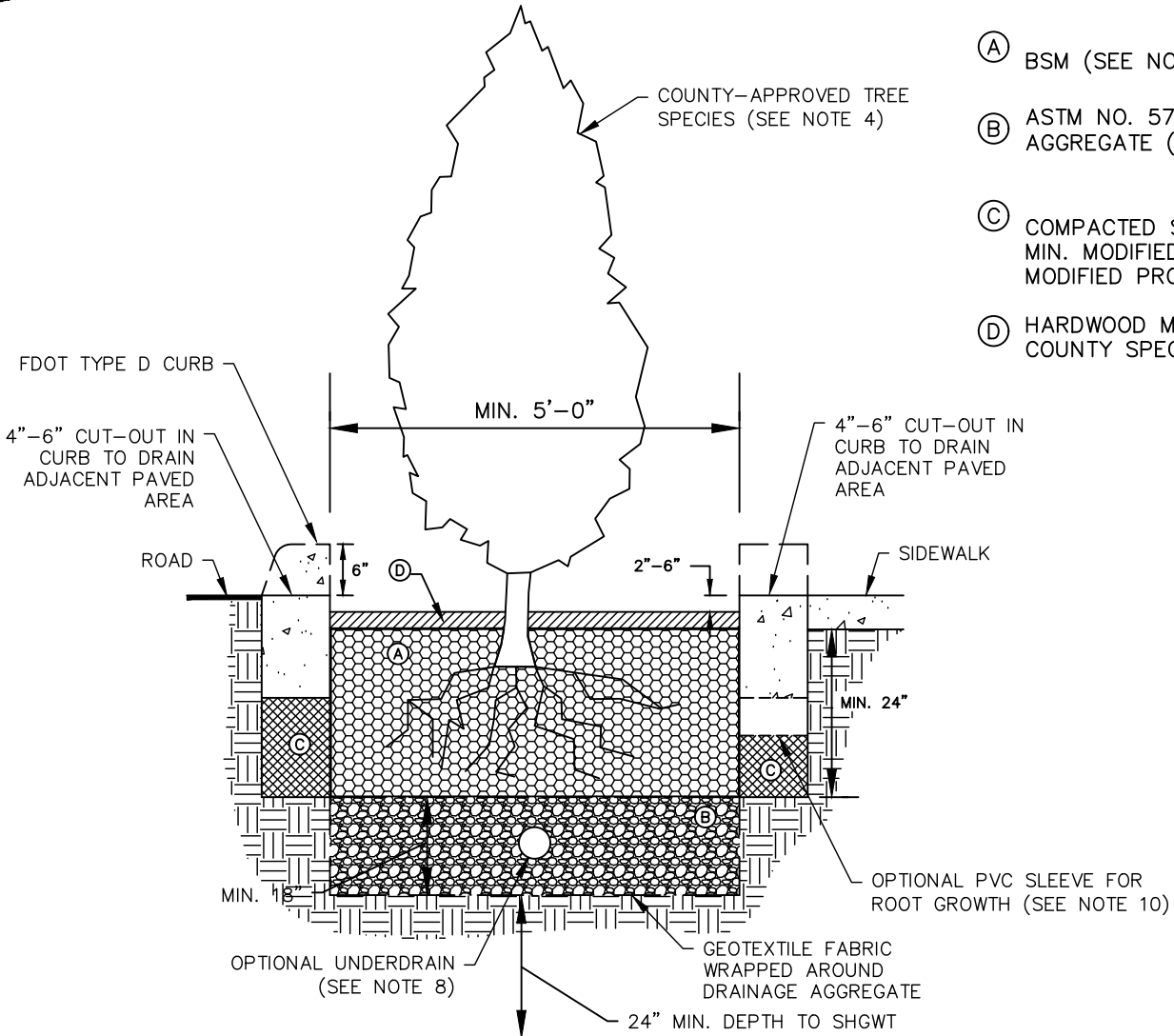
4.13.1 NOTES

DATE: MAY/2021

NOT TO SCALE

REVISION:

- (A) BSM (SEE NOTE 9)
- (B) ASTM NO. 57 DRAINAGE AGGREGATE (SEE NOTE 7)
- (C) COMPACTED SUBGRADE TO 98: MIN. MODIFIED PROCTOR, 95% MODIFIED PROCTOR.
- (D) HARDWOOD MULCH PER COUNTY SPEC



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3. ALL DIMENSIONS CAN BE MODIFIED TO FIT SITE CONSTRAINTS; MODIFICATIONS MUST BE DESIGNED BY LICENSED ENGINEER.
4. TREE SELECTION SHOULD COMPLY WITH SECTION 138-3655. REFER TO PLANTING SPEC SHEET FOR PLANTING DESIGN AND MAINTENANCE INFORMATION BASED ON SECTION 138-3664 OF ARTICLE X, COMMUNITY DESIGN STANDARDS.
5. VEGETATED SYSTEMS MUST BE ABLE TO RECOVER REQUIRED TREATMENT VOLUME IN 24 TO 36 HOURS TO PREVENT DAMAGE TO VEGETATION.
6. DRAINAGE AGGREGATE MUST BE WASHED AND FREE OF LIMESTONE.
7. DRAINAGE AGGREGATE MUST BE WRAPPED WITH NON-WOVEN, NON-DEGRADABLE FILTER FABRIC THAT MEETS THE GEOTEXTILE REQUIREMENTS PROVIDED IN FDOT DESIGN STANDARDS INDEX NO. 199 FOR GEOTEXTILE TYPE D-3.
8. UNDERDRAIN REQUIRED IF THE SHGWT IS WITHIN 12" FROM THE TREE WELL BOTTOM OR IF THE NATIVE SOIL INFILTRATION DOES NOT ALLOW ADEQUATE INFILTRATION. UNDERDRAIN TO BE DESIGNED BY ENGINEER PER PINELLAS COUNTY DETAIL INDEX NUMBER 1290.
9. BIORETENTION SOIL MIX (BSM) SHOULD CONSIST OF 30-40% COMPOST AND 60-70% SAND BY VOLUME. SEE BSM AND BAM SPECIFICATIONS.
10. TREE ROOT GROWTH ZONE SHOULD BE DESIGNED PER SITE AND DESIGN CONSTRAINTS. TREE ROOT REQUIREMENTS TO BE DETERMINED BY LANDSCAPE ARCHITECT. ENGINEER TO DESIGN SUBGRADE.
11. MINIMUM UTILITY SETBACKS AND PROTECTION MEASURES MUST CONFORM TO CURRENT PINELLAS COUNTY STANDARDS. COORDINATE WITH UTILITY OWNER IN THE EVENT OF UTILITY CROSSING AND UTILITY CONFLICTS.
12. DESIGN ENGINEER MUST ENSURE FINAL DESIGN ADHERES TO ALL APPLICABLE COUNTY CODES.

**PINELLAS COUNTY**

TREE WELL TEMPLATE

FIGURE I.D.:	4.12.7
DATE:	MAY/2021
	<b>NOT TO SCALE</b>
REVISION:	



NOTES

1. SCHEDULE PRE-INSTALLATION MEETING WITH THE DESIGN ENGINEER 72 HOURS IN ADVANCE OF GREEN INFRASTRUCTURE CONSTRUCTION.
2. AREAS IN AND AROUND GREEN INFRASTRUCTURE SHOULD BE PROTECTED DURING EARTH MOVING TO PREVENT COMPACTION THAT WOULD REDUCE INFILTRATION RATES. PROTECTION THROUGHOUT CONSTRUCTION FROM SEDIMENT TRANSPORT THAT WOULD CLOG THE INFILTRATION CAPACITY OF NATIVE AND ENGINEERED SOILS.
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5. MINIMIZE NATIVE SOIL DISTURBANCE WHILE INSTALLING OVERFLOW STRUCTURE.
6. REPLACE MULCH ANNUALLY OR AS NEEDED, DEPENDING ON RAIN FREQUENCY FOR BEST RESULTS.

TREE WELL NOTES

1. NATIVE SPECIES WITH DROUGHT TOLERANCE CAPACITIES SHOULD BE PRIORITIZED.
2. SELECT A SLOW GROWING TREE OF MEDIUM SIZE TO PREVENT DEGRADATION OF STRUCTURAL CONCRETE BY ROOT SYSTEM.
3. GROWING MEDIUM SHALL BE PLACED ADJACENT TO GUTTER WALL.
4. TREE ROOT GROWTH MEDIUM SHALL BE EITHER CORNELL UNIVERSITY STRUCTURAL SOIL, SILVA CELL MATERIAL, OR APPROVED EQUAL.
5. VOLUME OF REQUIRED GROWING MEDIUM TO BE DETERMINED ACCORDING TO SITE CONDITIONS AND TREE SPECIES REQUIREMENTS.
6. TREE SPECIES SELECTION SHOULD BE BASED ON REGIONAL AVAILABILITY AND PRICE.

BIORETENTION SOIL MIX (BSM) AND BIOSORPTION ACTIVATED MEDIA (BAM) SPECIFICATION

1. BSM WILL ADHERE TO THE FOLLOWING:
  - a. 30-40% COMPOST AND 60-70% SAND BY VOLUME. SEE BIORETENTION MEDIA TECHNICAL SPECIFICATIONS.
  - b. ORGANIC CONTENT MATTER FROM 4-8% BY WEIGHT
  - c. COMPACT TO 85% MAXIMUM DENSITY PER ASTM D 1557
  - d. MINIMUM LONG-TERM HYDRAULIC CONDUCTIVITY OF 5 INCH/HOUR PER ASTM D2434.
  - e. MAXIMUM IMMEDIATE HYDRAULIC CONDUCTIVITY OF 12 INCHES/HOUR
2. BSM SHOULD BE MIXED UNIFORMLY AND ONSITE CHARACTERISTICS SHOULD BE VERIFIED BY MATERIALS TESTING PRIOR TO PLACEMENT.
3. PLACE UNSATURATED BSM IN 8 INCH LIFTS. DO NOT PLACE IF SATURATED.
4. TO PRESERVE INFILTRATION CAPACITY OF NATIVE SOIL, KEEP MACHINERY OUTSIDE OF GREEN INFRASTRUCTURE AREA.
5. AFTER PLACEMENT, COMPACT EACH LIFT TO 85% MAXIMUM DENSITY USING WATER UNTIL SATURATED. DO NOT USE A VIBRATORY COMPACTOR.

MAINTENANCE GUIDELINES

1. WATER PLANTS THOROUGHLY FOLLOWING PLANTING TO SETTLE THE SOIL AROUND THE ROOTS UNTIL ESTABLISHMENT HAS TAKEN PLACE.
2. REMOVE DEBRIS AND RUBBISH ON A MONTHLY BASIS.
3. PERFORM SPRING MAINTENANCE TO REMOVE BUILT UP DEBRIS FROM WINTER, PROVIDE PRE-EMERGENT PLANT CARE AND INSTALL/REPLACE MULCH AS NECESSARY.
4. TRIM VEGETATION TO ENSURE SAFETY, AESTHETICS, PROPER OPERATION, OR TO SUPPRESS WEEDS AND INVASIVE VEGETATION.
5. CUT BACK PERENNIALS AND REMOVE LEAF DEBRIS AT END OF GROWING SEASON.
6. REPLACE UNSUCCESSFULLY ESTABLISHED PLANTS
7. INSPECT AND CORRECT EROSION PROBLEMS, DAMAGE TO VEGETATION, SEDIMENT AND DEBRIS ACCUMULATION AND POOLS OF STANDING WATER.
8. REMOVE ALL LABELS, WIRES, ETC, FROM PLANTS

**PINELLAS COUNTY**

TREE WELL NOTES

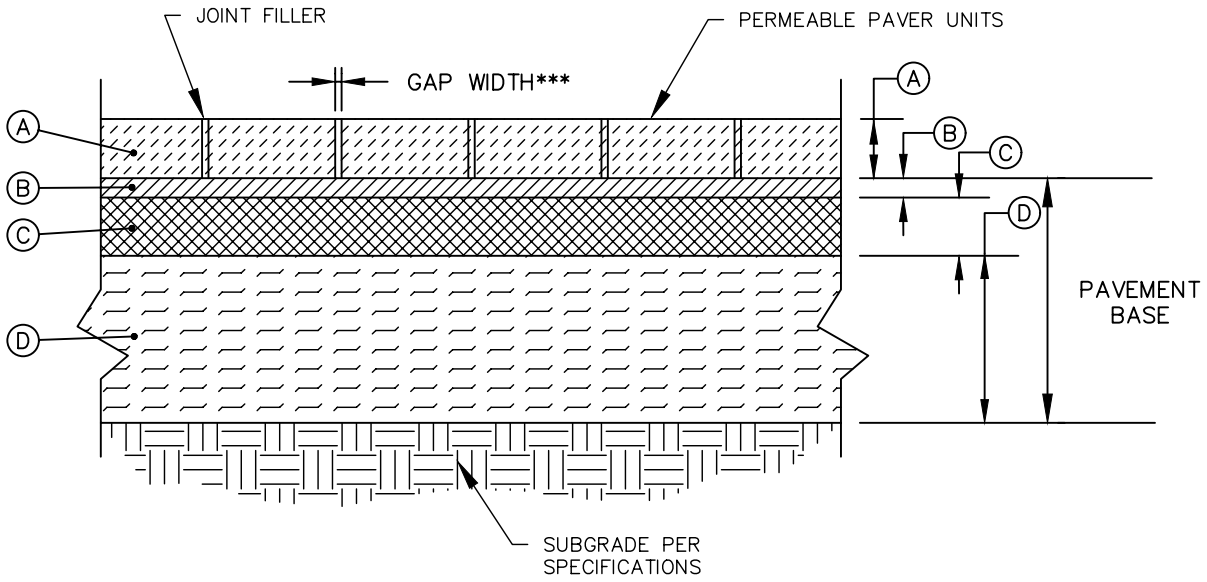
FIGURE I.D.:

4.12.7 NOTES

DATE: MAY/2021

NOT TO SCALE

REVISION:



MINIMUM MATERIAL THICKNESS (IN) - PERMEABLE PAVERS

LAYER	MATERIAL TYPE*	MODERATE VEHICULAR		LIGHT VEHICULAR		PEDESTRIAN	
		GOOD SOILS**	POOR SOILS**	GOOD SOILS**	POOR SOILS**	GOOD SOILS**	POOR SOILS**
A	PERMEABLE PAVERS	3 1/8	3 1/8	3 1/8	3 1/8	3 1/8	3 1/8
B	BEDDING LAYER ASTM NO. 8	2	2	2	2	2	2
C	BASE LAYER ASTM NO. 57	6	6	6	4	4	4
D	RESERVOIR/SUBBASE LAYER ASTM NO. 2, 3, OR 57	22	28	-	10	-	-

GAP WIDTH (IN)***	JOINT FILLER AGGREGATE*
3/8 OR 1/2	ASTM NO. 8
1/4	ASTM NO. 9 OR 89
1/8	ASTM NO. 10

\* MATERIAL FINER THAN NO. 100 SIEVE SHALL NOT EXCEED 2 PERCENT FOR ANY AGGREGATE LAYER (LICENSED PROFESSIONAL TO SELECT AGGREGATE)  
 \*\* "GOOD" AND "POOR" SOIL CLASSIFICATION BASED ON AASHTO GUIDE FOR DESIGN OF PAVEMENT STRUCTURES. (LICENSED PROFESSIONAL MUST CALCULATE REQUIRED DEPTH BASED ON SITE CONDITIONS).

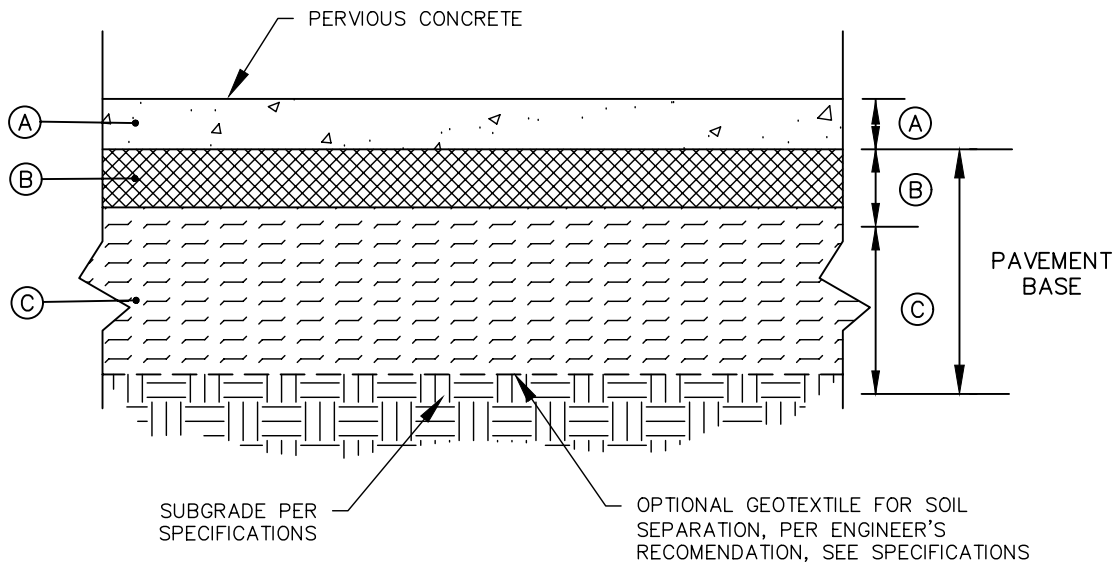
DESIGNER NOTES

- FOR PUBLIC PROJECTS, ALL ELEMENTS MUST BE WITHIN THE RIGHT OF WAY OR APPROPRIATE EASEMENTS.
- NO PRIVATE SYSTEMS SHALL BE PLACED IN THE PUBLIC RIGHT OF WAY.
- SEE PERMEABLE UNIT PAVERS SPECIFICATIONS FOR WEARING COURSE, PAVEMENT BASE, SUBGRADE, AND OTHER REQUIREMENTS FOR PERMEABLE UNIT PAVES FACILITIES.
- FILTER FABRIC MUST HAVE PERMEABILITY GREATER THAN THE SOIL BELOW.
- UNDERDRAIN REQUIRED IF THE SHGWT IS WITHIN 24" FROM THE BOTTOM OF THE PERVIOUS PAVEMENT SYSTEM OR IF THE NATIVE SOIL INFILTRATION DOES NOT ALLOW ADEQUATE INFILTRATION. UNDERDRAIN TO BE DESIGNED BY ENGINEER PER PINELLAS COUNTY DETAIL INDEX NUMBER 1290.
- MINIMUM UTILITY SETBACKS AND PROTECTION MEASURES MUST CONFORM TO CURRENT PINELLAS COUNTY STANDARDS. COORDINATE WITH ENGINEER IN THE EVENT OF UTILITY CROSSING AND UTILITY CONFLICTS.
- DESIGN ENGINEER MUST ENSURE FINAL DESIGN ADHERES TO ALL APPLICABLE COUNTY CODES.

**PINELLAS COUNTY**

PERVIOUS PAVEMENT  
(PERMEABLE PAVERS)

FIGURE I.D.:	4.6.1
DATE:	MAY/2021
	<b>NOT TO SCALE</b>
REVISION:	



MINIMUM MATERIAL THICKNESS (IN) - PERVIOUS CONCRETE							
LAYER	MATERIAL TYPE*	MODERATE VEHICULAR		LIGHT VEHICULAR		PEDESTRIAN	
		GOOD SOILS**	POOR SOILS**	GOOD SOILS**	POOR SOILS**	GOOD SOILS**	POOR SOILS**
A	PERVIOUS CONCRETE LAYER	9	9 1/2	6 1/2	7	4	5
B	BEDDING LAYER ASTM NO. 8	6	6	6	6	6	6
C	OPTIONAL RESERVOIR/SUBBASE LAYER ASTM NO. 2, 3, OR 57	-	-	-	-	-	-

\* MATERIAL FINER THAN NO. 100 SIEVE SHALL NOT EXCEED 2 PERCENT FOR ANY AGGREGATE LAYER (LICENSED PROFESSIONAL TO SELECT AGGREGATE)

\*\* "GOOD" AND "POOR" SOIL CLASSIFICATION BASED ON AASHTO GUIDE FOR DESIGN OF PAVEMENT STRUCTURES. (LICENSED PROFESSIONAL MUST CALCULATE REQUIRED DEPTH BASED ON SITE CONDITIONS).

**DESIGNER NOTES**

1. FOR PUBLIC PROJECTS, ALL ELEMENTS MUST BE WITHIN THE RIGHT OF WAY OR APPROPRIATE EASEMENTS.
2. NO PRIVATE SYSTEMS SHALL BE PLACED IN THE PUBLIC RIGHT OF WAY.
3. SEE PERVIOUS CONCRETE SPECIFICATIONS FOR WEARING COURSE, PAVEMENT BASE, SUBGRADE, AND OTHER REQUIREMENTS FOR PERVIOUS CONCRETE FACILITIES.
4. FILTER FABRIC MUST HAVE PERMEABILITY GREATER THAN THE SOIL BELOW.
5. UNDERDRAIN REQUIRED IF THE SHGWT IS WITHIN 24" FROM THE BOTTOM OF THE PERVIOUS PAVEMENT SYSTEM OR IF THE NATIVE SOIL INFILTRATION DOES NOT ALLOW ADEQUATE INFILTRATION. UNDERDRAIN TO BE DESIGNED BY ENGINEER PER PINELLAS COUNTY DETAIL INDEX NUMBER 1290.
6. MINIMUM UTILITY SETBACKS AND PROTECTION MEASURES MUST CONFORM TO CURRENT PINELLAS COUNTY STANDARDS. COORDINATE WITH ENGINEER IN THE EVENT OF UTILITY CROSSING AND UTILITY CONFLICTS.
7. DESIGN ENGINEER MUST ENSURE FINAL DESIGN ADHERES TO ALL APPLICABLE COUNTY CODES.

**PINELLAS COUNTY**

PERVIOUS PAVEMENT  
(PERVIOUS CONCRETE)

FIGURE I.D.:

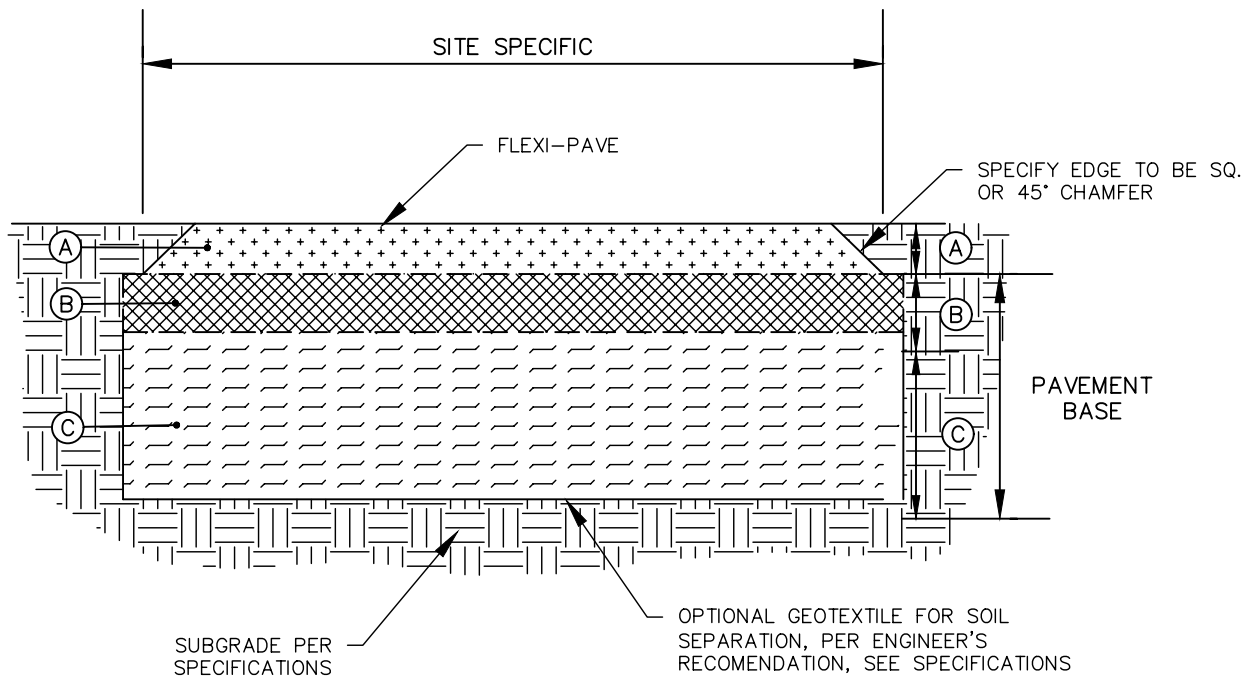
4.6.2

DATE:

MAY/2021

**NOT TO SCALE**

REVISION:



MINIMUM MATERIAL THICKNESS (IN) - FLEXI-PAVE

LAYER	MATERIAL TYPE*	PEDESTRIAN		LIGHT VEHICULAR	
		GOOD SOILS**	POOR SOILS**	GOOD SOILS**	POOR SOILS**
A	FLEXI-PAVE LAYER	1.5	1.5	1.5	1.5
B	BEDDING LAYER ASTM NO. 51 STONE, 96% COMPACTION	4	4	4	4
C	OPTIONAL RESERVOIR/SUBBASE LAYER ASTM NO. 57 STONE	-	-	-	-

\* MATERIAL FINER THAN NO. 100 SIEVE SHALL NOT EXCEED 2 PERCENT FOR ANY AGGREGATE LAYER (LICENSED PROFESSIONAL TO SELECT AGGREGATE)

\*\* "GOOD" AND "POOR" SOIL CLASSIFICATION BASED ON AASHTO GUIDE FOR DESIGN OF PAVEMENT STRUCTURES. (LICENSED PROFESSIONAL MUST CALCULATE REQUIRED DEPTH BASED ON SITE CONDITIONS).

DESIGNER NOTES

- FOR PUBLIC PROJECTS, ALL ELEMENTS MUST BE WITHIN THE RIGHT OF WAY OR APPROPRIATE EASEMENTS.
- NO PRIVATE SYSTEMS SHALL BE PLACED IN THE PUBLIC RIGHT OF WAY.
- SEE FLEXI-PAVE SPECIFICATIONS FOR WEARING COURSE, PAVEMENT BASE, SUBGRADE, AND OTHER REQUIREMENTS FOR PERVIOUS CONCRETE FACILITIES.
- FILTER FABRIC MUST HAVE PERMEABILITY GREATER THAN THE SOIL BELOW.
- UNDERDRAIN REQUIRED IF THE SHGWTS IS WITHIN 24" FROM THE BOTTOM OF THE PERVIOUS PAVEMENT SYSTEM OR IF THE NATIVE SOIL INFILTRATION DOES NOT ALLOW ADEQUATE INFILTRATION. UNDERDRAIN TO BE DESIGNED BY ENGINEER PER PINELLAS COUNTY DETAIL INDEX NUMBER 1290.
- MINIMUM UTILITY SETBACKS AND PROTECTION MEASURES MUST CONFORM TO CURRENT PINELLAS COUNTY STANDARDS. COORDINATE WITH ENGINEER IN THE EVENT OF UTILITY CROSSING AND UTILITY CONFLICTS.
- DESIGN ENGINEER MUST ENSURE FINAL DESIGN ADHERES TO ALL APPLICABLE COUNTY CODES.

**PINELLAS COUNTY**

PERVIOUS PAVEMENT  
(FLEXI-PAVE™)

FIGURE I.D.:

4.6.3

DATE: MAY/2021

**NOT TO SCALE**

REVISION:

DESIGN AND CONSTRUCTION NOTES

1. NATIVE SOIL INFILTRATION RATE TO BE 1.0 INCH/HOUR OR GREATER. IF NOT, THEN AN UNDERDRAIN IS REQUIRED.
2. AGGREGATE BASE COURSE DEPTH DEPENDENT ON TRAFFIC LOADING AND NATIVE SOILS IN A WET, UNCOMPACTED STATE.
3. PERVIOUS PAVEMENT SURFACES NEED TO BE PROTECTED FROM SEDIMENT DURING THE ENTIRE CONSTRUCTION PROCESS.
4. FULL EXTENT OF POROUS PAVEMENT SHALL BE FENCED OFF DURING CONSTRUCTION TO PREVENT COMPACTION OF SUBGRADE AND STOCKPILING OF CONSTRUCTION MATERIALS OVER SURFACE.
5. IF DURING EXCAVATION OF NATIVE SOILS, THE BOTTOM OF THE EXCAVATION IS EXPOSED TO RAIN, HAND RAKE THE SURFACE TO A DEPTH OF 3 INCHES TO RESTORE INFILTRATION CAPACITY.
6. AGGREGATE BASE COURSE SHALL BE WASHED ON-SITE TO REDUCE WASH LOSS TO 0.5%. AGGREGATE SHOULD BE HOSED OFF WHILE ON TRUCK OR AFTER STOCKPILING. RINSE OFF AS PILE IS UTILIZED AS FINES WILL MIGRATE TO LOWER LEVELS OF PILE.

MAINTENANCE GUIDELINES

1. PREVENT RUN-ON OF SEDIMENT IN RUNOFF FROM ADJACENT AREAS.
2. SWEEP/VACUUM MIN. ONE OR TWO TIMES PER YEAR, INCREASE FREQUENCY AS NEEDED.
3. FIELD DETERMINATION OF IN-SITU PERMEABILITY OF PERVIOUS PAVEMENTS SHOULD BE DETERMINED USING AN EMBEDDED RING INFILTROMETER KIT (ERIK).
4. WHEN INFILTRATION RATES BETWEEN JOINTS BECOMES UNACCEPTABLE, USE A VAC TRUCK TO REMOVE JOINT MATERIALS ALONG WITH ACCUMULATED SEDIMENT. REPLACE JOINT MATERIAL TO ORIGINAL INSTALLATION SPECIFICATION. MAINTENANCE FREQUENCY WILL VARY BASED ON SEDIMENT LOADING.

**PINELLAS COUNTY**

PERVIOUS PAVEMENT NOTES

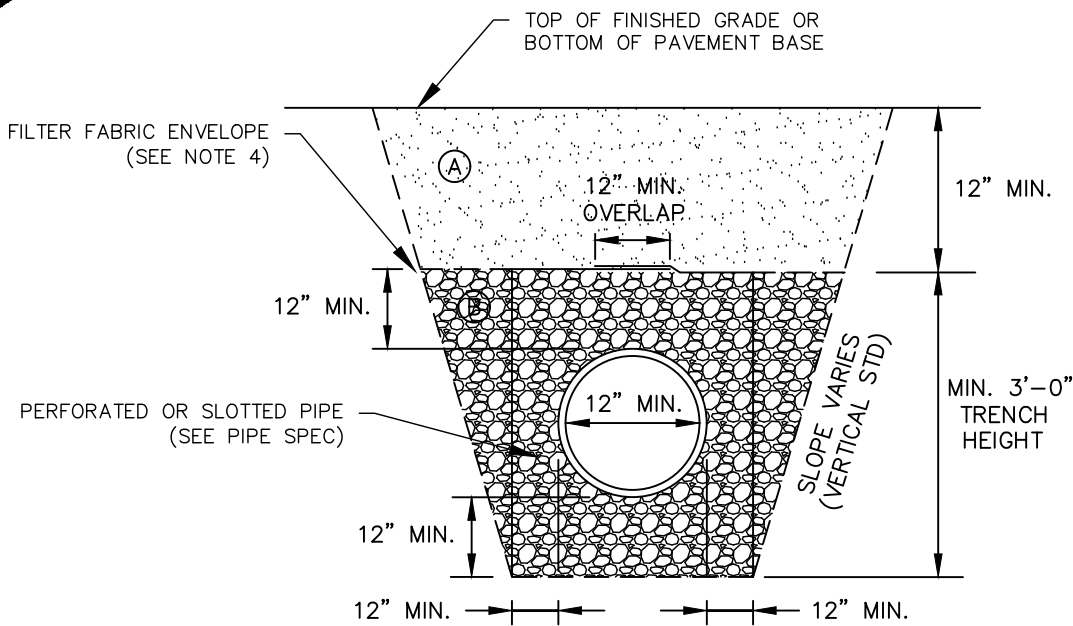
FIGURE I.D.:

4.6 NOTES

DATE: MAY/2021

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REVISION:



ROUND PIPE		
Pipe Size	Slot Cut	
	Opening c	
	Min.	Max.
15"	12"	14"
18"	12"	14"
24"	16"	18"
30"	16"	18"
36"	22"	24"
42"	22"	24"
48"	22"	24"
54"	24"	26"
60"	24"	26"
66"	24"	26"
72"	24"	26"

ELLIPTICAL PIPE		
Pipe Size	Slot Cut	
	Opening c	
	Min.	Max.
14"x23"	10"	12"
19"x30"	14"	16"
24"x38"	14"	16"
29"x45"	20"	22"
34"x53"	20"	22"
38"x60"	20"	22"

- (A) BACKFILL OR EMBANKMENT
- (B) #4 COARSE AGGREGATE

**DESIGNER NOTES**

1. FOR PUBLIC PROJECTS, ALL ELEMENTS MUST BE WITHIN THE RIGHT OF WAY OR APPROPRIATE EASEMENTS.
2. NO PRIVATE SYSTEMS SHALL BE PLACED IN THE PUBLIC RIGHT OF WAY.
3. PERFORATED OR SLOTTED PIPES SHALL TERMINATE A MINIMUM OF TWO (2) FEET FROM THE END OF THE EXFILTRATION TRENCH OR CONNECT TO ADDITIONAL INLETS OR MANHOLES.
4. DRAINAGE AGGREGATE MUST BE WRAPPED WITH NON-WOVEN, NON-DEGRADABLE FILTER FABRIC THAT MEETS THE GEOTEXTILE REQUIREMENTS PROVIDED IN FDOT DESIGN STANDARDS INDEX NO. 199 FOR GEOTEXTILE TYPE D-3.
5. DISTANCE FROM EXFILTRATION TRENCH INVERT TO SEASONAL HIGH GROUNDWATER TABLE VARIES; 12" OR GREATER.
6. ENGINEER TO DESIGN FINAL EXFILTRATION TRENCH DIMENSIONS INCLUDING SLOPES OF SIDEWALLS IN ACCORDANCE WITH SITE AND SOIL CONDITIONS.
7. MINIMUM UTILITY SETBACKS AND PROTECTION MEASURES MUST CONFORM TO CURRENT PINELLAS COUNTY STANDARDS. COORDINATE WITH UTILITY OWNER IN THE EVENT OF UTILITY CROSSING AND UTILITY CONFLICTS.
8. DESIGN ENGINEER MUST ENSURE FINAL DESIGN ADHERES TO ALL APPLICABLE COUNTY CODES.

**PINELLAS COUNTY**

EXFILTRATION TRENCH

FIGURE I.D.:	4.2.1
DATE:	MAY/2021
	<b>NOT TO SCALE</b>
REVISION:	