

Green Infrastructure for Texas

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Green Infrastructure for Texas

Introduction to Green Infrastructure Online Course

NO COST & SELF-PACED

Designed for Professionals

- City Managers
- Elected Officials
- Environmental Specialists
- Emergency Mgmt Coordinators
- Landscape Architects
- Municipal Engineers
- Parks and Rec Dir.
- Public Works
- Stormwater Manager
- Zoning & Planning



Learn

Basic green infrastructure (GI) concepts and practices



Analyze

How GI can benefit and be implemented into your community



Evaluate

Ways your community could integrate GI into their local and municipal plans



Ghirardi WaterSmart Park
League city, Tx

tcwp.tamu.edu/resources/introduction-to-green-infrastructure

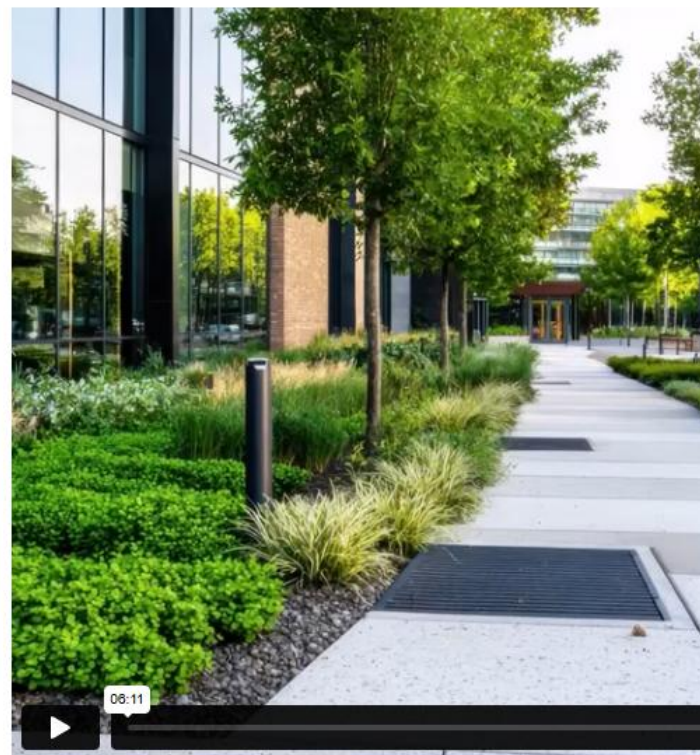
www.agrilife.org/gift



TEXAS A&M
AGRI LIFE
EXTENSION | DISASTER ASSES
AND RECOVERY

Funded by the Texas General Land

Online Training Course



What is Green Infrastructure?

Section 1



TEXAS
GENERAL
LAND OFFICE

TEXAS A&M
AGRI LIFE



Engineering Design Sets (TBA)

- Bioswales
- Stormwater Outfalls
- Rain Gardens
- Biorententions
- etc

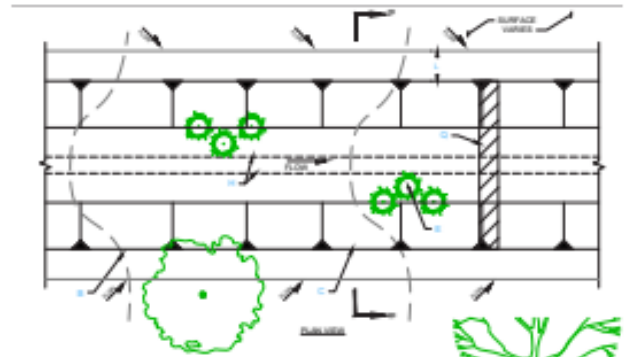
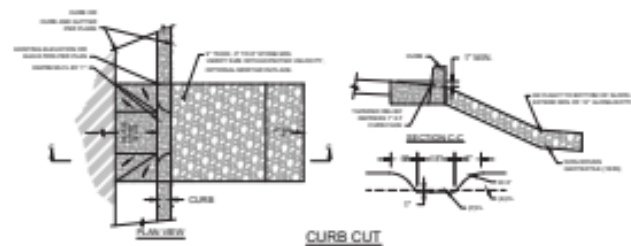
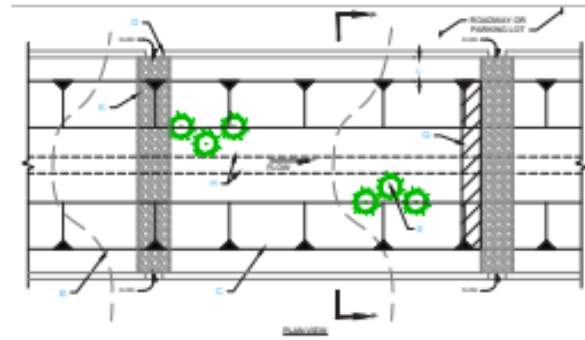
CAD Details

General Notes

1. Trees and shrubs should be located in accordance with inundation zone and elevation zone.
2. Check dams as necessary depending on site longitudinal slope.
3. Mulch type and location per project plans shall be informed by evaluation of hydraulic conditions and may be used for erosion prevention, slope stabilization, or design preference. Organic mulch may be used where design velocity is less than 1 fps.
4. Stable grass lining may be used in place of mulch per project plans.
5. Avoid compaction of bioswale bottom during and after construction to maintain infiltration rate.

Legend

- A. Ground cover, rock, or mulch as appropriate.
- B. Conceptual design contour.
- C. Top of bioswale/channel/ditch.
- D. Curb opening / drainage notch.
- E. Plants per project plans.
- F. Water surface at desired ponding depth.
- G. Scarify subgrade to depth of 12" min.
- H. 2-foot row planting zone: groundcover or rock preferred.
- I. 3" freeboard, min. or as required by local guidance.
- J. 3H:1V side slope or flatter, typ.
- K. Erosion protection at flow inlet. Compact subgrade below erosion protection to 95% of max density. Refer to project plans for dimensions and details.
- L. 2' step out when bioswale along roadway. 1' setback along other pedestrian routes. Cross slope shall match shoulder or 2% max.
- M. Filter trench.
- N. Engineered media / permeable soils.
- O. Perforated underdrain.
- P. Gravel-filled trench.
- Q. Optional check dam.



Ecological Benefit Cost Analysis (TBA)



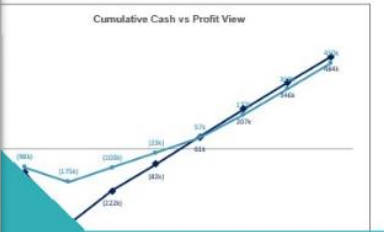
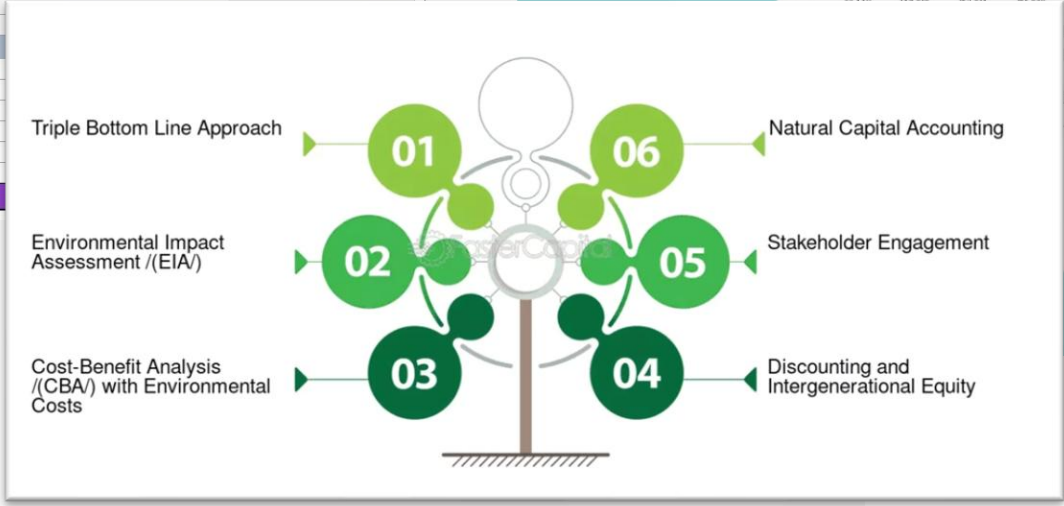
Project ABC Cost Benefit Analysis

LINK TO FRONT SHEET

Cash View	2019 USD	2020 USD	2021 USD	2022 USD	2023 USD	2024 USD	2025 USD	2026 USD
One-off Costs								
Fixed Asset Investments	-	(250,000)	-	-	-	-	-	-
Project Staff Costs	(120,000)	(102,400)	-	-	-	-	-	-
Project Expenses	(3,000)	(3,060)	-	-	-	-	-	-
Total One-Off Costs	(123,000)	(375,460)	-	-	-	-	-	-
Net Benefits								
Change in Net Revenue	-	-	-	-	-	-	-	-
Change in Working Capital Requirements	-	-	-	-	-	-	-	-
Change in Ongoing Staff Costs	-	73,440	143,810	152,814	155,870	150,380	162,167	165,411
Change in Ongoing Other Expenses	-	3,060	6,242	6,367	6,495	6,624	6,757	6,892
Change in Tax Payments	-	24,500	13,167	(16,712)	(13,300)	(13,300)	(23,387)	(23,783)
Total Net Benefits	-	101,100	175,227	140,463	143,029	145,639	156,927	158,518
Net Cash Flows	(123,000)	(274,360)	175,227	140,469	143,029	145,639	156,927	158,518
Cumulative Net Cash Flows	(123,000)	(397,360)	(222,133)	(81,664)	61,365	207,004	345,331	484,443

Key Cost Benefit Metrics

- Total One-Off Costs: 2019 - 2026 (USD) **(491,460)**
- Average Benefits Per Annum: 2019 - 2026 (USD) **163,222**
- Net Present Value (NPV): 2019 - 2026 (USD) **198,367**
- Internal Rate of Return (IRR): 2019 - 2026 **26.5%**
- Profitability Index (Pre-Tax): 2019 - 2026 **1.38**
- Payback Years: 2019 - 2026 **4.50**
- Break-Even Quarter: 2019 - 2026 **3Q23**





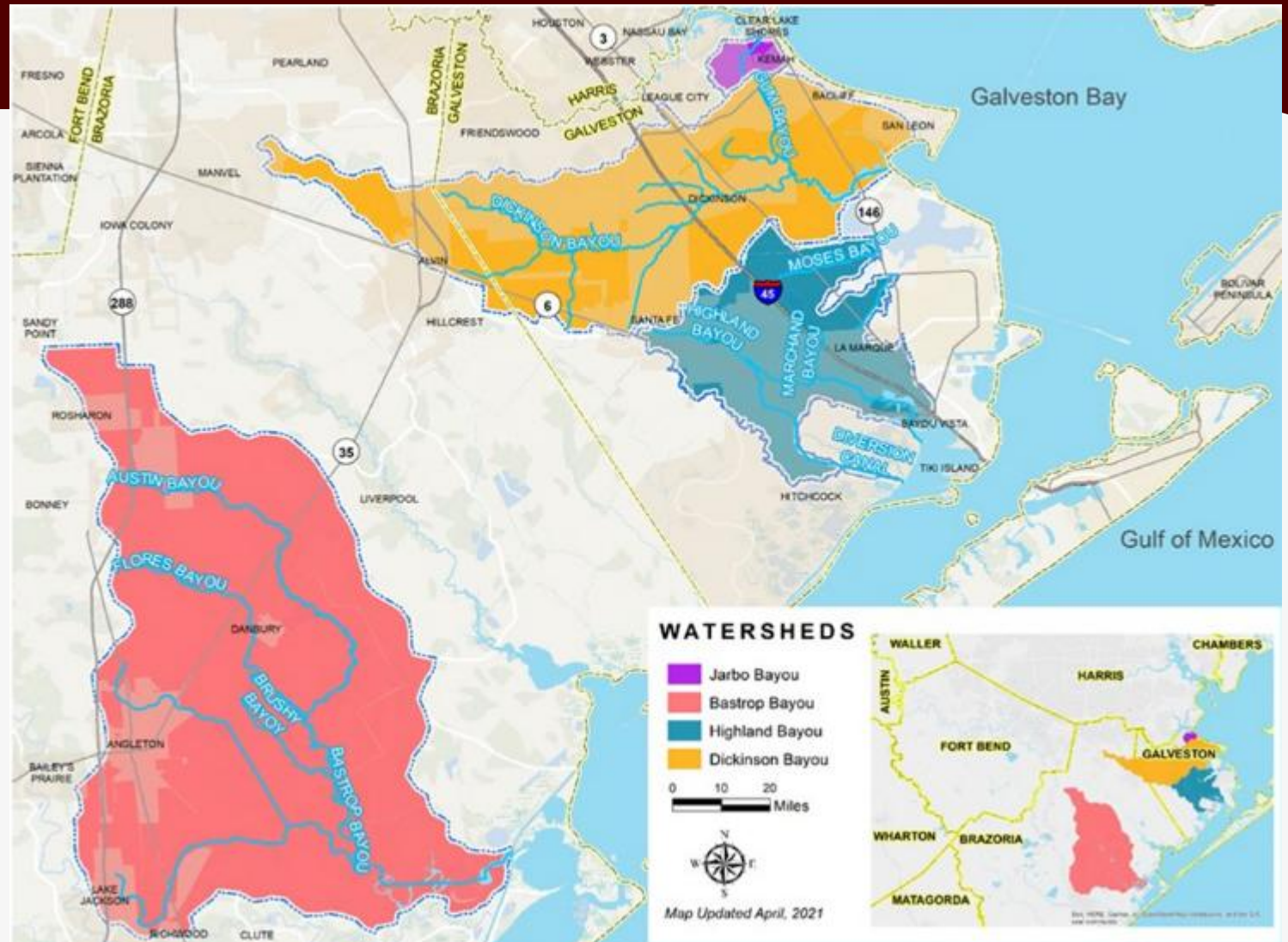
Marchand Bayou, Carbide Park, La Marque



Virginia Point Peninsula Preserve, Reitan Point



Dickinson Bayou



Galveston Bay Coalition of Watersheds

Wetland Programs & High School Internships in Green Infrastructure



- Technical Assistance in Wetland Construction
- Floating Wetland Assistance
- On the ground planting Projects



- Wetland Training for Master Naturalist
- Town Hall and Brown Bag Presentations
- Other Educational Opportunities



- Green Infrastructure High School Internship Program (local Houston/Galveston area only)
- Students work on GI projects and give a presentation at the completion of the program.

Sheldon Lake State Park



Clean Coast Texas Collaborative Green Infrastructure Workshop

Plan to attend this half-day workshop and find out more about nature-based practices to clean and conserve stormwater for people and wildlife at any scale: **business or home, urban/suburban or industrial, local or regional.**

Local elected officials, municipal representatives, county staff, landowners, and facilities managers will benefit from attending. Speakers will focus on the why and the how of green infrastructure practices.

Save the Date

Aug | 26 | 2025

Mont Belvieu, TX

Registration to follow. Contact Scott Jones at scott.jones@ag.tamu.edu or 832-856-3451 for more information.

TOPICS:

Guidance for sustainable stormwater drainage on the Texas Coast.

Collecting and cleansing stormwater at home and in your local neighborhood.

Using wetlands within the drainage system to enhance water quality and wildlife habitat.

Protecting and restoring large-scale wetlands and natural areas for flood control and water quality benefits.

**Green infrastructure is not complicated.
Green infrastructure is not easy.**

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