

Resiliency and Sustainability Advisory Committee Meeting

February 1, 2024

Welcome and Moment of Silence

By: Stewart Weinberg, Vice Chairperson

Agenda

1. Welcome, Moment of Silence
New Member Introduction
Election of Chairperson and Vice Chairperson Stewart Weinberg, Vice Chairperson
2. Climate Action Plan: 2023 Progress Report Katie McKain
3. Sustainability Updates and 2024 Priorities Katie McKain
4. Resilience Updates and 2024 Priorities Dale Morris
5. Sustainable Construction Materials and Methods Presentation April Magill, Root Down Building Collective
6. Public Comment Period*

Election of Chairs

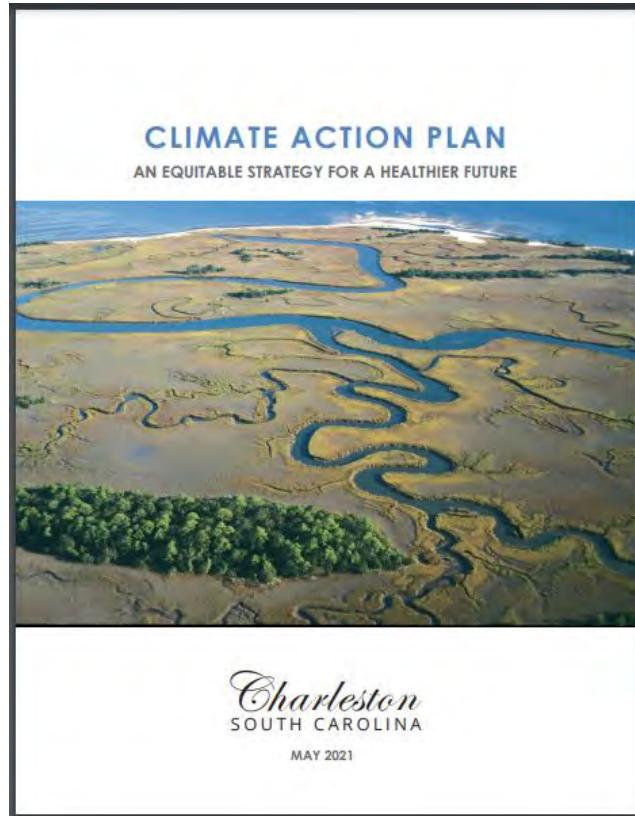
By: Stewart Weinberg, Vice Chairperson

Climate Action Plan Progress Report

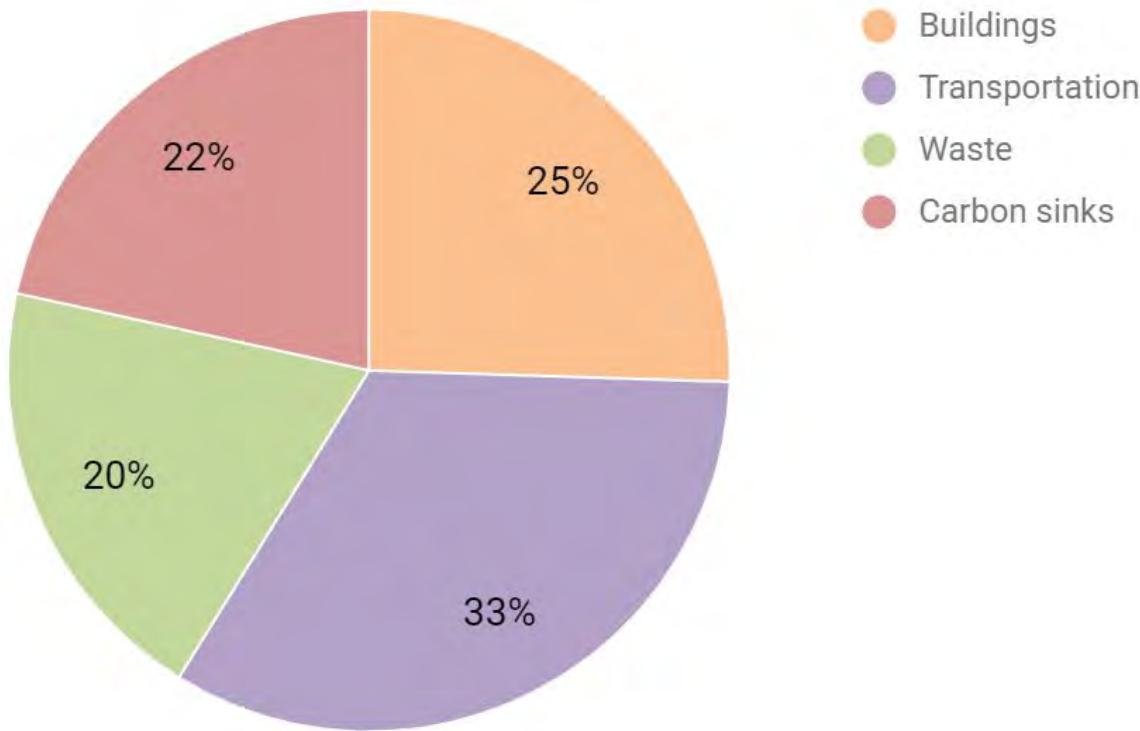
By: Katie McKain, Director of Sustainability

Climate Action Plan

- May 2021 Adoption
- 5-Year Strategy to complete 50 actions
- Annual Progress Report shows plan implementation



12 Strategies & 51 Action Items



Co-Benefits

Every action in the plan has two or more additional benefits for Charlestonians, such as:

- Cost savings
- Improve mobility / decrease traffic
- Improve public health / air quality
- Ecosystem protection / water quality
- Safety
- Economic development and retention
- Enhance climate adaptation
- Historic preservation
- Cultural preservation
- Raise awareness and role model
- Beautification

CAP Progress Highlights



WASTE

- 155 TONS OF FOOD SCRAPS COMPOSTED, 14 DROP SITES, 2,072 HOUSEHOLDS COMPOSTING, AND 253 METRIC TONS OF CO₂E ELIMINATED*
- 700+ PUMPKINS COMPOSTED (2.4 TONS)*
- 75 NEW RECYCLING CAN LIDS FOR CITY PARKS
- SUSTAINABLE EVENT MANUAL CREATED



CAP Progress Highlights



TRANSPORTATION

- 2 ELECTRIC NISSAN LEAFS ADDED TO CITY FLEET, PREVENTING 1.8 METRIC TONS OF CO₂E*
- 98,897 TRIPS (160,000 MILES) IN BIKE SHARE AVOIDING 13 METRIC TONS OF CO₂E*
- 100% OF LEAF BLOWER FLEET IS ELECTRIC, ELIMINATING 356 METRIC TONS OF CO₂E YEARLY
- 7,358 REMOTE STAFF WORK DAYS, ELIMINATES 90 METRIC TONS OF CO₂E FROM COMMUTE (2022)



CAP Progress Highlights



CARBON SINKS

- 29 RAIN GARDENS AND 12 RAINWATER HARVESTING SYSTEMS INSTALLED, INFILTRATING 511,845 GALLONS OF WATER*
- 146 TREES PLANTED ON PUBLIC PROPERTY*
- 50 STORM DRAINS ADOPTED*
- MULBERRY FOOD FOREST PLANTING IN 2024



CAP Progress Highlights



BUILDINGS

- REPLACEMENT OF EV CHARGING STATIONS
READY FOR PERMITTING- WILL EXPAND TO 28
CHARGING STATIONS AND TO 4 CITY GARAGES
- ALL NEW CITY CONSTRUCTION PLANNED
TO FOLLOW CHARLESTON RISES BUILDING
CERTIFICATION PROGRAM



CAP Progress Highlights



EDUCATION AND COMMUNITY ENGAGEMENT

- 200+ RESIDENTS PARTICIPATED IN PUMPKIN SMASH EVENT, COMPOSTING OVER 700 PUMPKINS
- 6 CLIMATE AMBASSADOR PRESENTATIONS, INSPIRING 226 PEOPLE TO TAKE CLIMATE ACTION*
- 200 RESIDENTS AT DRIVE ELECTRIC CHARLESTON EVENT LEARNED ABOUT ELECTRIC VEHICLES
- 10 COMPOST WORKSHOPS REACHED OVER 750 RESIDENTS, 550 KITCHEN CADDIES GIVEN AWAY
- 600+ RESIDENTS ENGAGED AT WEST ASHLEY FARMERS MARKET (April - Nov, 2023)
- 12 MONTHLY COMMUNICATION CAMPAIGNS WITH HUNDREDS OF SOCIAL MEDIA INTERACTIONS*



Sustainability Updates and 2024 Priorities

By: Katie McKain, Director of Sustainability

2024 CAP Priorities

Strategize and Apply for Federal Grant Opportunities (7-15 in hopper)

Solar For All

Energy Efficiency & Conservation Block Grant

HUD Green and Resilient Retrofits Program

Climate Pollution Reduction Grant

Environmental Justice Community Change Grant

Safe Streets For All

Clean Heavy Duty Program

National Fish and Wildlife Foundation Coastal Resilience Fund Grant:

NEVI Charging & Fueling Competitive Grant

NOAA's Climate Ready Workforce

Diesel Emission Reduction National Grants

Region 4 Sustainable Materials Management Grants

DOE Technical Assistance for Adoption of Latest and Zero Building Codes

FY25 Rebuilding American Infrastructure for Sustainability and Equity (RAISE)

2024 CAP Priorities

Expand Residential Compost Program

- Add drop sites to become full service
 - Including Johns Island!
- Leverage more partners
- Host training workshops & kitchen compost bin giveaways
- Target youth at tabling opportunities
- 2nd Annual Pumpkin Smash and more option for pumpkin composting



2024 CAP Priorities

Electric Vehicles

- Fleet Transition Plan

EV Charging Infrastructure

- Upgrade 8 existing EV Stations in garages to 28 networked ports
- Creating EV parking policy
- BCDCOG Regional Electric Vehicle Infrastructure Plan (public parking)
 - a. CFI Grant application



2024 CAP Priorities

- Report on goal progress in Floodstat and add more dashboards
- Perform emissions Inventory for 2022
- Increase and adapt outreach to target youth
 - Train 2024 Climate Ambassador cohort
 - Riverdogs event (County)
 - Grow Your Own Food
- Complete and share monthly social media toolkits to all partners (50% complete in 2023)



Charleston City Council bans extra-thick plastic bags to close litter-causing loophole

BY TOBY COX TCOX@POSTANDCOURIER.COM

20 HRS AGO

f
x
e



Extra-thick plastic bags are now included in the plastic bag ban in Charleston. File/Warren L. Wise/Staff

Inform and support businesses affected

Support school composting programs





Charleston Rainproof

every drop counts



**Rain gardens are a proven,
effective way to reduce flooding
and soak up stormwater runoff.**

Visit charleston-sc.gov/rainproof for more info and to apply.

FUNDING & TRAINING AVAILABLE TO INSTALL A RAIN GARDEN

The Rainproof Mini-Grant Program provides \$200 to support the installation of a new rain garden on your property! (about half the cost)

Applications will be accepted **August 11 - August 31, 2023**, first come, first served, and while funding lasts.

Open to City of Charleston and Charleston County residents, businesses and organizations.

No experience necessary!

Grow

Charleston Rainproof with County



RAIN BARREL SALE

The Ashley Cooper Stormwater Education Consortium has partnered with Rainwater Solutions to provide **50 gallon Ivy Rain Barrel** at a discounted price of **\$77** each.

Place your order by
Sunday, May 21

CHARLESTON RAINPROOF is about us, the whole community - working together to utilize both public and private spaces to capture rainwater and address extreme rainfall.

[www.charleston-sc.gov/rainproof](http://charleston-sc.gov/rainproof)

LOWCOUNTRY EARTH WEEK

APRIL 15-22, 2023

ALLIANCE FOR PLANET EARTH • AUDUBON SOUTH CAROLINA • CAROLINA OCEAN ALLIANCE • CHARLESTON AREA BEEKEEPERS ASSOCIATION
CHARLESTON AREA JUSTICE MINISTRY • CHARLESTON CLIMATE COALITION • CHARLESTON COUNTY GOVERNMENT
CHARLESTON COUNTY PUBLIC LIBRARY • CHARLESTON GREEN DRINKS • CHARLESTON PARKS CONSERVANCY • CHARLESTON MARSHKEEPER
CHARLESTON MOVES • CHARLESTON SURFRIDER FOUNDATION • CHARLESTON WATERKEEPER • CITY OF CHARLESTON GOVERNMENT
COASTAL CONSERVATION LEAGUE • COASTAL EXPEDITIONS & THE COASTAL EXPEDITIONS FOUNDATION • COMMUNITY PRIDE OF CHARLESTON
COUNTY (ADOPT-A-HIGHWAY) • FOLLY BEACH ASSOCIATION OF BUSINESS LITTER COMMITTEE • FRIENDS OF GADSDEN CREEK
GREEN HEART PROJECT • ISLE OF PALMS CLEANUP CREW • KEEP CHARLESTON BEAUTIFUL • KIawah CONSERVANCY • LOWCOUNTRY LAND TRUST
LOWCOUNTRY MARINE MAMMAL NETWORK • MEDICAL UNIVERSITY OF SOUTH CAROLINA • MESSA • SOUTH CAROLINA AQUARIUM • SOUTH CAROLINA
ENVIRONMENTAL LAW PROJECT • SULLIVANS ISLAND FOR ALL • SUNRISE MOVEMENT CHARLESTON • THE SUSTAINABILITY INSTITUTE
SUSTAINABLE OCEAN ALLIANCE CHARLESTON • TURTLE SURVIVAL ALLIANCE

Browse all the **EARTH DAY** inspired
events happening in **APRIL** at:

<https://bit.ly/LowcountryEarthWeek>

2024 CAP Priorities

- Create regional Mattress Recycling program with County
- Planning for Renewable Energy on existing City structures, including a Facilities Management Plan
- Planning for energy efficiency to support low income housing retrofits
- Finish Zoning Code Rewrite- many CAP actions (Planning in lead)
- Complete Street Tree Inventory (Parks Dept in lead)

Resilience Status Updates

By: Dale Morris, Chief Resilience Officer

Overview

Groundwater Monitoring Update

Comprehensive, Integrated Water Plan

Union Pier Recommendations

Tidal and Inland Feasibility Study
(USACE)

NOAA: Climate Regional Resilience
Challenge Grant

2024?



City of Charleston

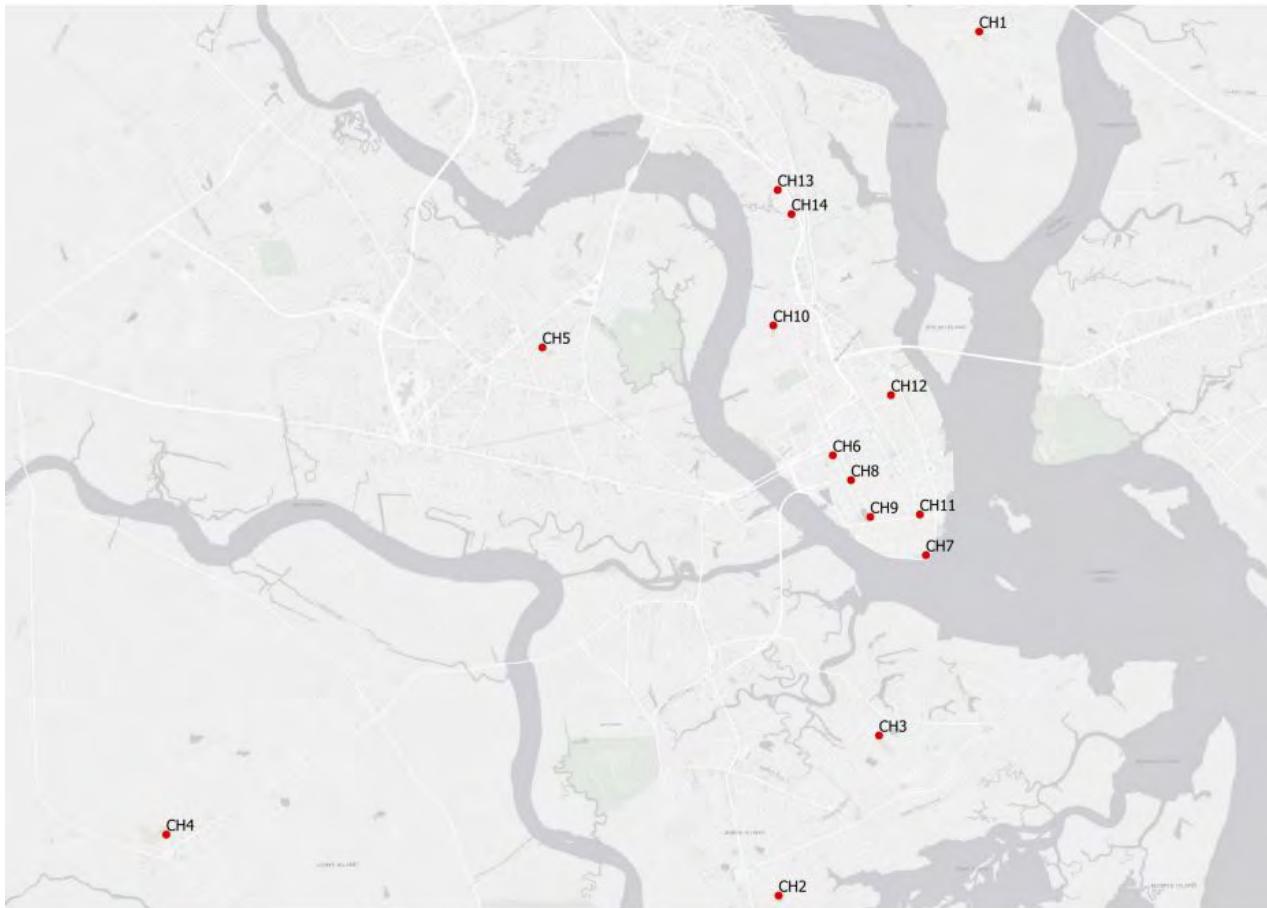


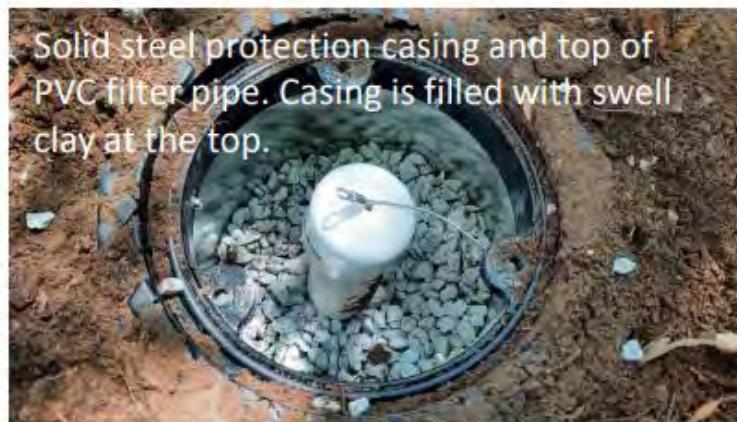
Charleston,

Groundwater Monitoring Wells

- 14 installed Summer 2023 (12 City, 2 for Rosemont / CCRAB)
- Funding for 4 more in 2024 (all off peninsula)
- Sites chosen for typology, soil, location to other infra, access

	A	B	C	D	E	F	G	
1	Div_id	Div_code	Name	Planning Area	Lat	Lon	Elevation_ft_NAVD88	Remarks
2	CH1	EJ600	Etiwan park	Daniel Island	32.85768	-79.9176	10.8	
3	CH2	EJ592	Westchester Playground	James Island	32.71321	-79.9591	7.8	
4	CH3	EJ696	James Island Recreational Center	James Island	32.73987	-79.9389	8.5	
5	CH4	EJ683	John's Island Park	Johns Island	32.72441	-80.0803	16.1	
6	CH5	EJ684	Lenevar Playground	West Ashley	32.80547	-80.0049	21.2	
7	CH6	EJ682	MUSC Colcock Hall	Peninsula	32.78689	-79.9475	10.2	
8	CH7	EJ869	White Point Gardens	Peninsula	32.77002	-79.9292	7.6	
9	CH8	EJ695	Cannon Park	Peninsula	32.78272	-79.9439	5.4	
10	CH9	EJ703	Colonial Lake	Peninsula	32.77652	-79.9402	4	
11	CH10	EJ857	Corinne Jones Park	Peninsula	32.80878	-79.959	9.1	
12	CH11	EJ687	Washington Square	Peninsula	32.77684	-79.9304	12.2	
13	CH12	EJ692	Hampstead Park	Peninsula	32.7969	-79.9359	13	
14	CH13	EJ686	Rosemont Park	Peninsula	32.83148	-79.9579	5.7	
15	CH14	EJ689	Freddie Whaley Community Center	Peninsula	32.8274	-79.9552	10.5	
16								





Description



The TD-Diver is a submersible datalogger for long-term uninterrupted, real-time water level monitoring using a pressure sensor when submerged at a fixed level under the water surface. The pressure sensor measures the equivalent hydrostatic pressure of the water above the sensor diaphragm to calculate the total water depth. The Diver autonomously measures pressure and temperature and records them in its internal memory. The Diver is ideal for ground and surface water level applications.

The TD-Diver features:

- Designed for up to 10 years of use.
- Solid enclosure to make borehole deployments easier.
- Spend less time in the field with fast download speeds.
- Large memory enables users to take a sample every 15 minutes for 2 years.
- Enhanced data integrity with the new backup memory feature.
- Compatible with all of your existing Diver accessories.

This Diver features a stainless steel (316 L) casing with a 22 mm diameter. The TD-Diver can store a maximum of 72,000 measurements (date/time, pressure, and temperature) in its working memory and 72,000 measurements in its backup memory.

The TD-Diver samples pressure and temperature at fixed length intervals and stores these values in fixed length or continuous memory.

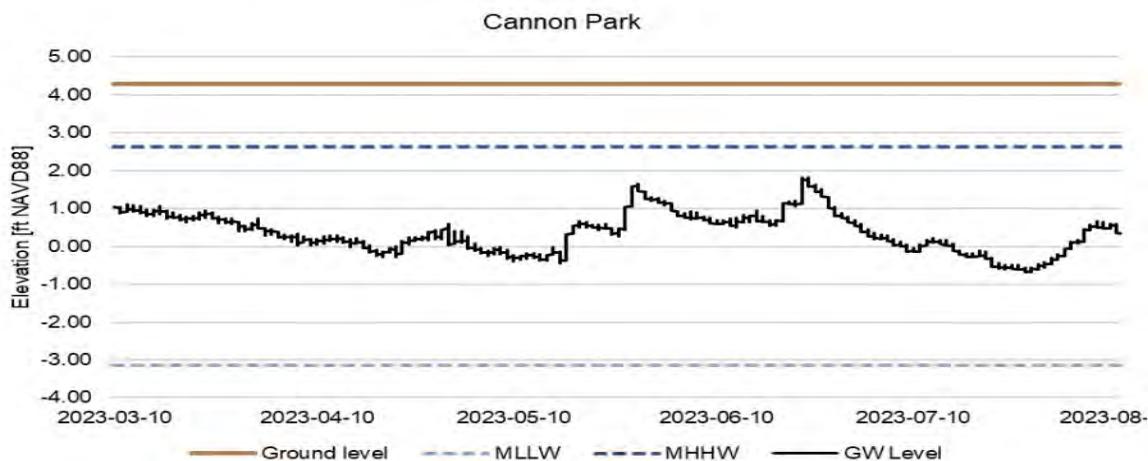
The TD-Diver is available in the following pressure ranges 10 m, 20 m, 50 m, and 100 m.

Contact us for more information or to obtain a quote.

Data, for City, other researchers and public

Diver samples @ 1 hr intervals

Groundwater time series



Webviewer:

GW level

Soil conditions at site

Ground level

Tide stage (harbor water level)

Tide datums

Rainfall

Air Pressure

Other weather (drought, etc.)

CofC Graduate EVSS Intern

archaeologist

May 2024 RSAC meeting



Comprehensive Water Plan 2050: Key Water Levels – Peninsula

March 2024

City-wide

Data Collection

Data Analysis

Engagement

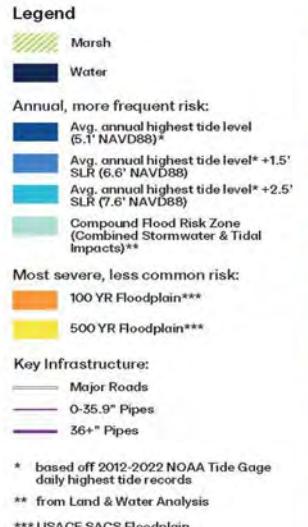
Environmental Justice

Policy recommendations

Key project recommendations

Story-map format

Mayor and Team review



Union Pier: Water Plan Team SOW. Funding approved by City Council Sept 2023, work start Oct 2023, deliverables end of 2023

PM, Meetings and Coordination

- Riley Center
- Advisory Group
- Planner hired by Riley Center
- Peninsula Plan Team

Review / Assessment of previous analysis and infrastructure

Review of 2D H&H modeling by Port (Sherwood and Thomas & Hutton)

CIWP Coastal and Stormwater Analysis

- UPT and nearby basins (beyond adjacent basins)
- Assume USACE perimeter protection
- Conceptual drainage analysis of UPT and nearby basins to understand target (water) volumes and locations and techniques to manage those volumes

Key Findings / Recommendations

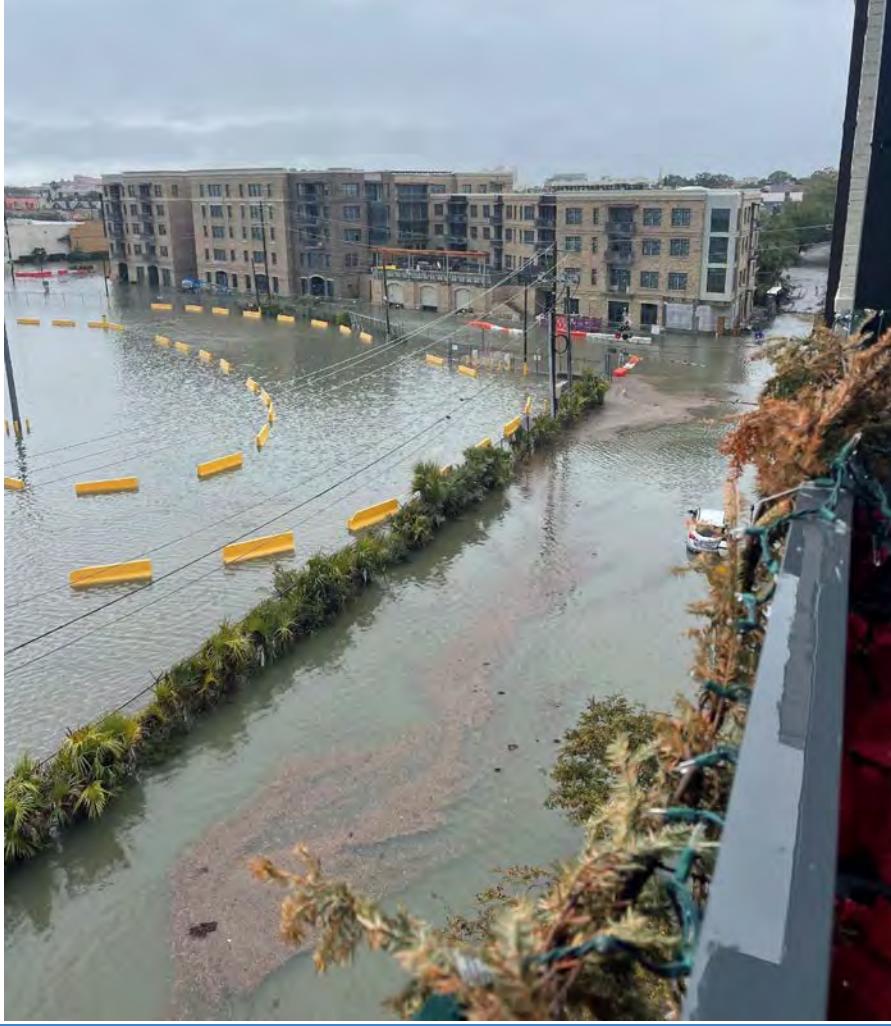
Urban (water) Design Framework for all forces of water and SLR

Support to Peninsula Plan team for Waterfront Development District / Comp Plan Amendment

Union Pier: future combined surge, tidal, rainfall





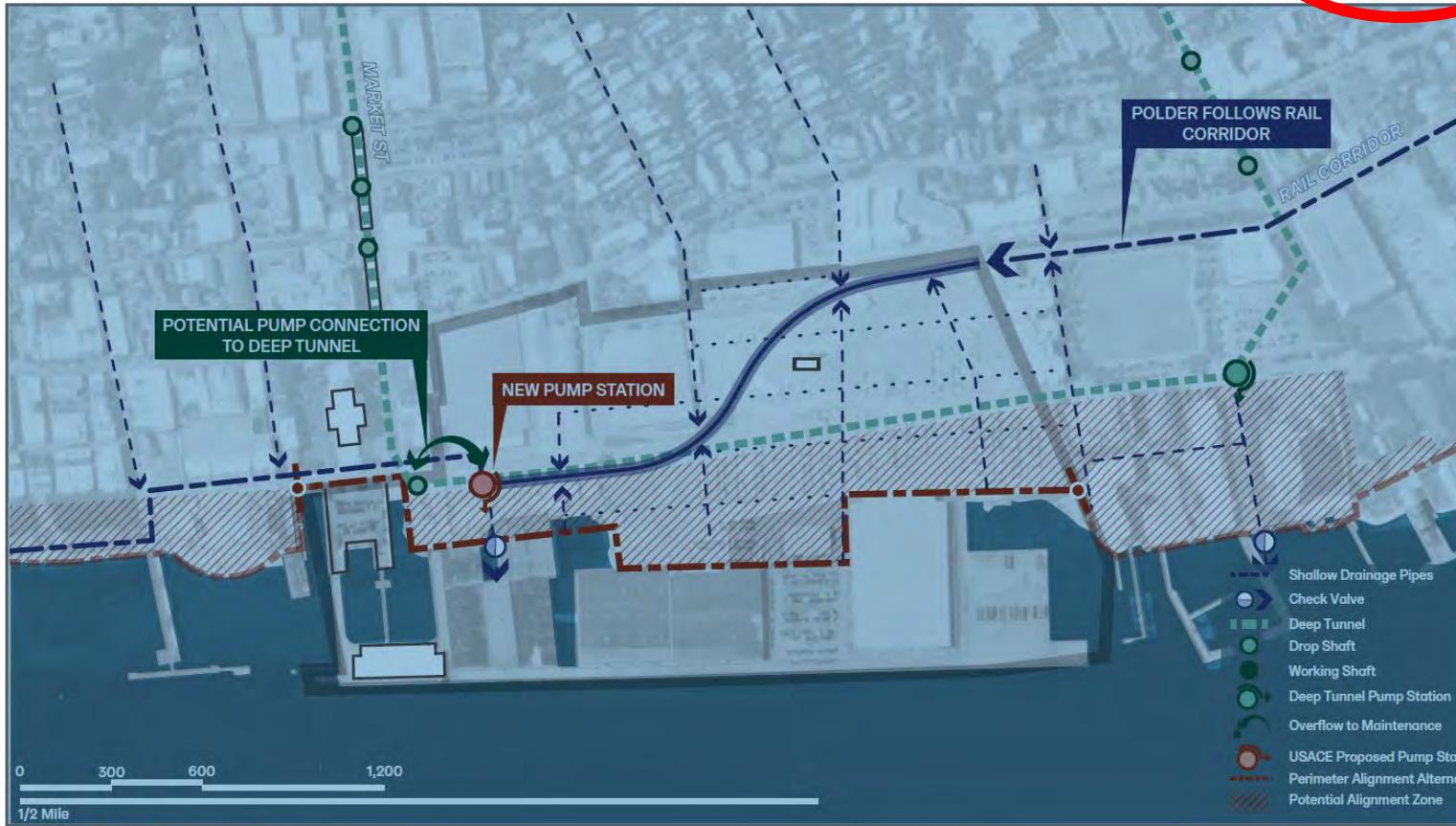


City of Charleston



Charleston,

Long Term: Polder Interconnections



12/13/23 DRAFT

USACE Tidal and Inland (rainfall) Study, kick-off Feb 2024

Tidal & Inland study authorized in 2020, funded in 2023.

Priority areas identified in **Comprehensive Water Plan** to jump-start feasibility scoping.

Recommended projects cost-shared 65% - 35%.

Inform Peninsula Perimeter Protection design
Integrated tidal, rainfall, storm surge benefits

WRDA 2022, S 8106: flooding associated with:

tidally influenced rivers, bays, and estuaries

rainfall of any magnitude or frequency

tide of any magnitude or frequency

groundwater emergence

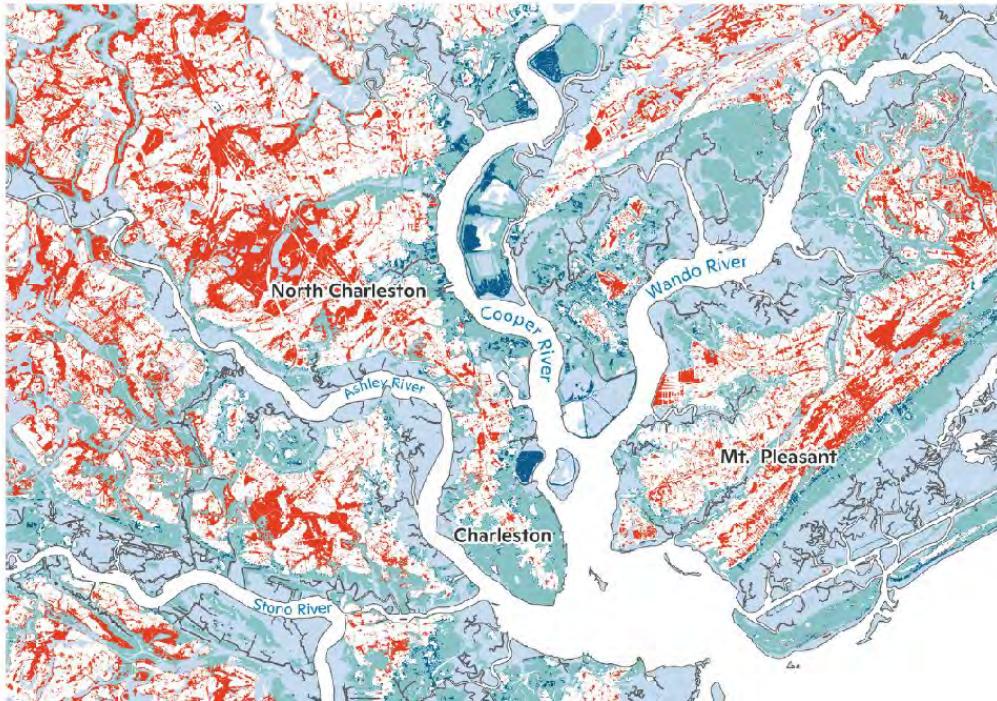
sea level rise

subsidence

From Woodwell Modeling to CRRC

Woodwell vs FEMA
100-Year Flood

Wetlands Both
Woodwell FEMA



NOAA Climate Regional Resilience Challenge (CRRC)

Regional Resilience? Watersheds...

Charleston + N. Charleston + Mt. Pleasant + Charleston
County + BCDCOG

BCDCOG as lead (regional)

City CIWP as inspiration for Tri-County

LOI Aug 2023

Full Nov 2023 (only +/- 100 of 800)

Application due Feb 9

Applause to BCDCOG!

Regional Resilience Water Plan

\$2m

No match (staff)

2024?

Flood Mitigation Assistance (grant)

Buyouts / capacity

At Scale

CIWP Education and Advocacy

Tidal and Inland Study (scoping, alternatives, analysis...)

Groundwater Analysis

PPP: local and CSRM local sponsor collaborations

CRRC Planning / Regional Collaboration

UPT as needed

“What the Mayor Says...” 

Sustainable Construction Materials and Methods

By: April Magill, Root Down Building Collective

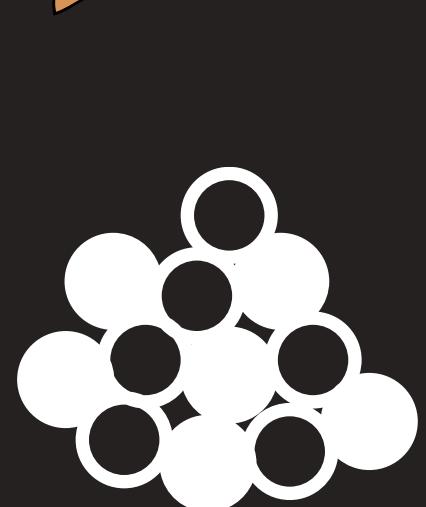




Pre-approved house &
ADU plans including
emission and IAQ
calculations



HOUSE PLAN Co.
by *RoofDown*
DESIGNS





[www.RootDown
BuildingCollective.org](http://www.RootDownBuildingCollective.org)

Root Down Building Collective is a
Charleston, SC-based 501c3
non-profit, charitable organization

**ADVANCING REGIONAL, CLIMATE-SMART
& EQUITABLE HOUSING SOLUTIONS**

RDBC Board of Directors & Staff

[Click here to learn more about who we are!](#)



APRIL MAGILL



TRACY MCCURRY



SAM YOUNG



GINA IACOVELLI



TIM CALLAHAN



TOM KNAUST



KEN MCCUMMINGS



BELVIN OLASOV



JAMES TOYE



CHAZE WILLIAMS



KELLY ANN FLYNN



ZAUDITU CHAMBERS

CHALLENGES FACING OUR COMMUNITIES

EMISSIONS

In the **City of Charleston** alone, buildings account for nearly **65% of citywide emissions** at 867,200 MtCO₂e and remain the largest sector of pollution citywide.

The Charleston Climate Action Plan strives to:

- **Reduce emissions 56% below 2018 levels by 2030.**
- **Reduce emissions to net zero by 2050.**

HOUSING INSECURITY

41% of City Plan survey respondents said they are somewhat or very concerned about being able to stay in their current housing. This percentage was more than 10 points higher among Black/African Americans and more than 20 points higher among lower-income respondents, youth and tenants.

Charleston County has stated that they will need an estimated 29,000 to 36,000 new units of housing over the coming decade.

In 40 of 46 counties statewide, the average South Carolina renter cannot afford a basic two-bedroom apartment without overextending their budget. There are 72,565 subsidized housing units in South Carolina, only enough to serve 20 percent of low-income renters statewide.

There are 375,996 mobile homes in South Carolina, which represents 16.5% of the total housing stock in the state, according to the U.S. Census Bureau. Mobile homes provide housing for the most low-income individuals and are nearing the end of their lifespans and will not withstand climate-related weather events.

HUMAN HEALTH REPERCUSSIONS & DISPARITIES

Poor indoor air quality due to excessive moisture, mold, and harmful VOCs from building materials is a growing concern. Poor indoor air quality is more prevalent for those living in sub-par housing situations, leading to health problems and creating more disparities for low-income communities.

SOLUTIONS PROVIDED BY RDBC

ROOT DOWN BUILDING COLLECTIVE (RDBC) is taking a collective approach, working with a growing team of regional professionals and stakeholders to advance climate-smart and equitable housing solutions for our most vulnerable communities in SC, through a 3-tiered approach:

- 1) RESEARCH & DESIGN / PILOT PROJECTS TO ADVANCE NEW MODULAR CONSTRUCTION SYSTEMS**
- 2) EDUCATION THROUGH OUR MOBILE CLASSROOM PROGRAMS**
- 3) ADVOCACY FOR CLIMATE-SMART & HEALTHY HOUSING**

Climate-smart (or carbon-storing) buildings are the key to a sustainable and resilient future. We can significantly reduce building-related greenhouse emissions not only by addressing “operational energy emissions”, but by also reducing the “upfront emissions” produced during the extraction, manufacturing, and transportation of building materials. With this approach, we create carbon-STORING buildings vs. carbon emitters. Current data shows us that we must take this approach in order to meet the reduction emission goals of 2030 & 2050.

Our Phase 1 approach, outlined here, will advance these building solutions through an R&D/Pilot Project & Education phase. In Phase 2, we will implement Phase 1 solutions into a scalable, healthy housing program to manufacture carbon-storing, climate-smart modular homes, while educating and empowering communities and creating new jobs and skills in the construction industry, with a focus on marginalized demographics.

Modular Healthy Homes will provide affordable, scalable housing solutions for our most vulnerable communities who will be the most affected by the repercussions of climate change. Furthermore, these solutions will enhance positive indoor air quality for the inhabitants and provide healthy, dignified living situations for our most marginalized communities.

RESEARCH + DESIGN:

PILOT PROJECTS

CLIMATE-SMART MATERIALS
MODULAR HOUSING



EDUCATION:

MOBILE CLASSROOM
COMMUNITY BUILDING



ADVOCACY:

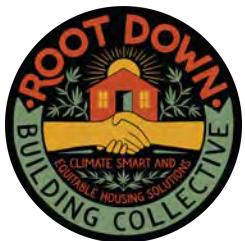
REDUCING CARBON
THROUGH HEALTHIER
HOMES



CHARLESTON HEALTHY HOUSING PILOT PROJECT



- Affordable Housing Solutions
- Climate-Smart, Sustainable, Healthy Housing
- Flood & Moisture Resistant
- New, Regional Construction Models
- Workforce Development & Community Building
- Modular, Scalable Solutions
- Reduce Greenhouse Emissions



Root Down Building Collective is an SC-based 501c3 non-profit, charitable organization

PROJECT OVERVIEW:

We will construct a 350SF studio utilizing an innovative bio-fabricated wall system which is well-suited to our humid environment. This modular system consists of prefabricated hemp-lime panels and regionally manufactured bio-based building materials. This project will establish a scalable housing solution with positive environmental & human health impacts, customized for our coastal environment; this project will serve as a crucial proof of concept and source of data collection which is necessary for our Phase 2 approach to scalable healthy housing solutions for our most vulnerable communities.

WHAT IS HEMP-LIME (AKA HEMPCRETE)?

Hempcrete is a non-structural, sustainable, and moisture/rot-resistant building material that is a viable alternative to traditional insulation. It is a mixture of hemp fibers, lime, and water that creates a lightweight and durable material that can be used to insulate the building envelope. Hempcrete has a variety of benefits, including its ability to store carbon (aka: reverse greenhouse emissions), regulate humidity, and its resistance to mold, pests, and fire. In addition, it is a renewable resource that can be grown quickly and sustainably in the Carolinas, making it a highly attractive option for healthier housing projects. Hempcrete is a “carbon-storing” & “climate-smart” building material.

In Rochester, NY in April of 2022, the International Code Council (ICC) approved hemp-lime for use in residential construction. The International Residential Code (IRC) Commentary for the Hemp-lime Appendix BA was submitted in June of 2023. Prior to formal issuance of Appendix BA, all projects utilizing this material are to be stamped by a licensed structural engineer. Appendix BA Hemp-Lime (Hempcrete) Construction will be included in the 2024 IRC

PROPERTIES OF HEMP-LIME

HEMP-LIME WALL MIX (APPLICATION - SPRAYED)

Density	330kg/m3	
Thermal Conductivity	0.07W/mK Heat capacity (est)	1400 J/kgK.



HEMP-LIME WALL MIX (APPLICATION - FORMED AND TAMPED)

Density	330 to 480kg/m3	Thermal Conductivity	0.07 to 0.11W/mK
Compressive Strength	1.0 MPa	* R = 2.4/inch	



HEMP-LIME WALL MIX (PLASTER APPLIED)

Dry density	440 kg/m ³	Dry thermal conductivity	0.115 W/mK	Dry thermal capacity	1560 J/kg.K
Flexural Strength	0.3-0.4 N/mm ²	Thermal Conductivity	$\lambda=0.06W/m.K$		
Heat Capacity	1500 – 1700 J/kg	Mean Acoustic Absorption Coefficient	0.69		
NRC Air Permeability	0.75 gm/m ² /mm hg	Vapor Permeability	24.2 gm/m ² /mm hg μ		
Vapor Diffusion Resistance	4.84	Fire Rating	1 hr BS EN 1365-1:1999		
Carbon Capture	130kgCO ₂ /m ³				



BUILDING WITH HEMP-LIME CAST-IN-PLACE METHOD



SOURCE: BRITISH BOARD OF AGREEMENT,
APPROVAL TESTING & CERTIFICATION.

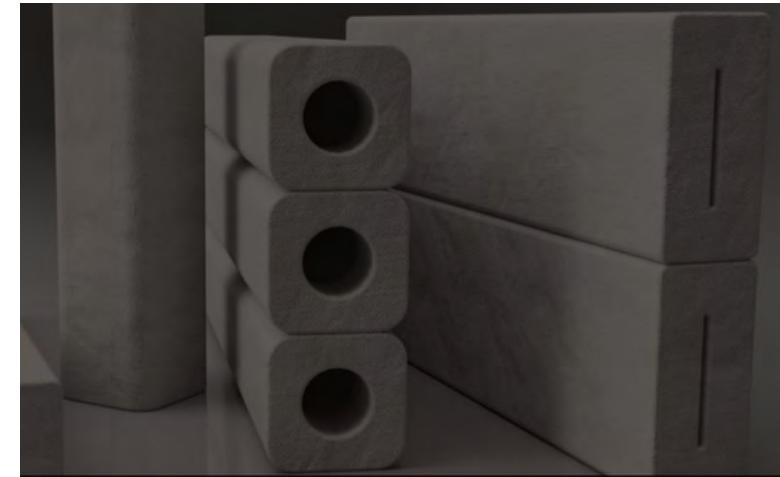
CERTIFICATE #10/4726

REGIONAL, BIO-BASED BUILDING MATERIALS

NC Grown Industrial Hemp



Hemp Wool Fiber Insulation



okom wrks labs



Arcadia Acres
South Carolina,
sustainably-milled
lumber

HEMPWOOD

NC Grown Grass Plywood

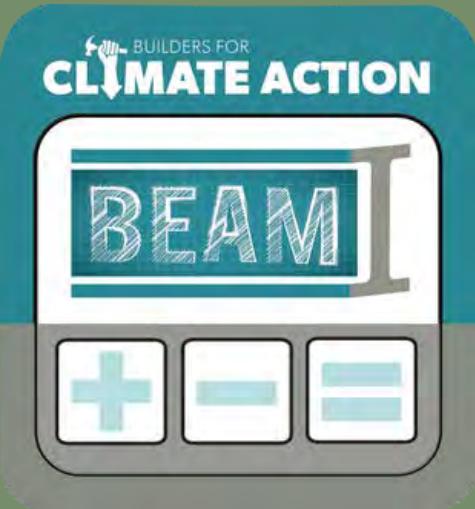


Concrete-free Foundation - Helical Piles System



KY Manufactured Hemp Flooring

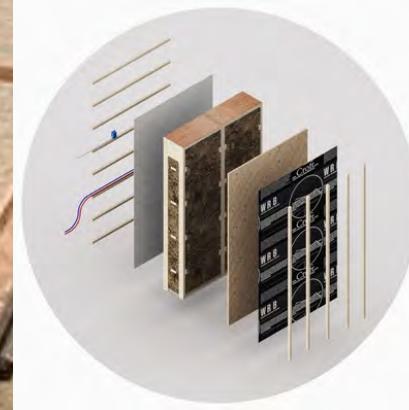




CALCULATING CARBON EMISSIONS FOR STATE POLICY CHANGE

Builders for Climate Action & the Healthy Building Network have created tools, research and resources to support practitioners and policy makers in making real zero-carbon buildings with healthier indoor air quality.

Emission numbers for embodied carbon as well as building operations need to be included our state's climate action plan.



New Frameworks

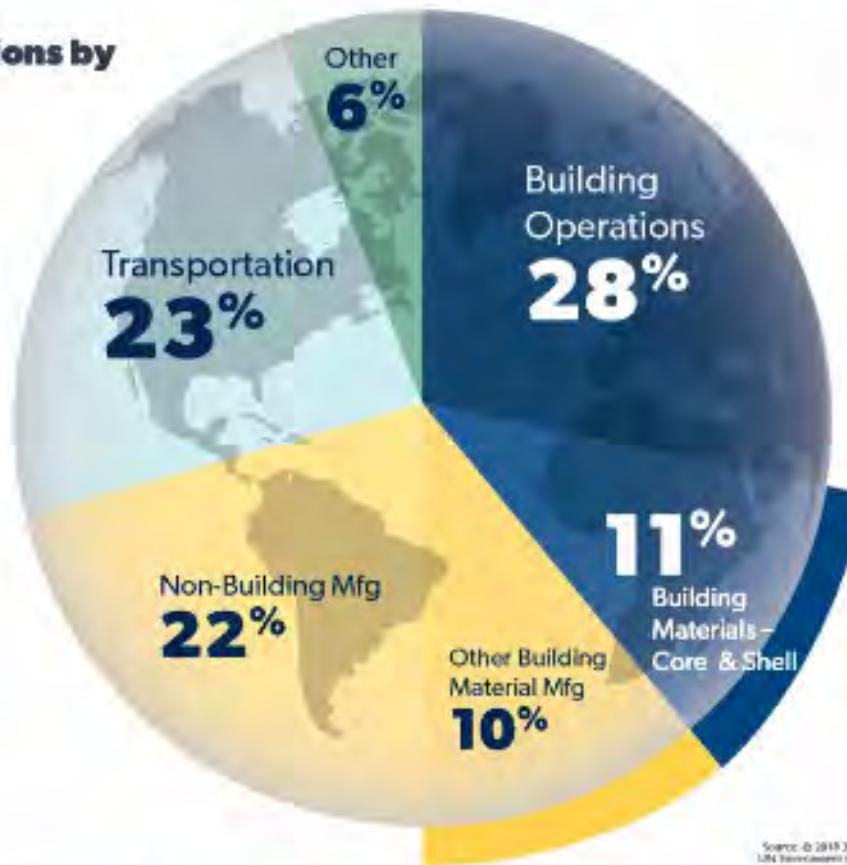
CROFT

PREFAB PANELS FOR CARBON STORING, HIGH PERFORMANCE BUILDINGS

Companies such as Croft & New Frameworks fabricate carbon-sequestering panels with straw, hemp or cellulose for high-performance building envelopes with minimum fuss.

How much do buildings CONTRIBUTE TO CLIMATE CHANGE?

**Total global emissions by
sector, 2017**



Source: © 2019 3000, Inc. / Architecture 2030. All Rights Reserved. Data Sources: UN Environment Global Status Report 2017; IEA, International Energy Outlook 2017

We can't meet global targets without addressing buildings



CAN WE TRANSFROM
BUILDINGS FROM A
CARBON SOURCE TO
A CARBON SINK?



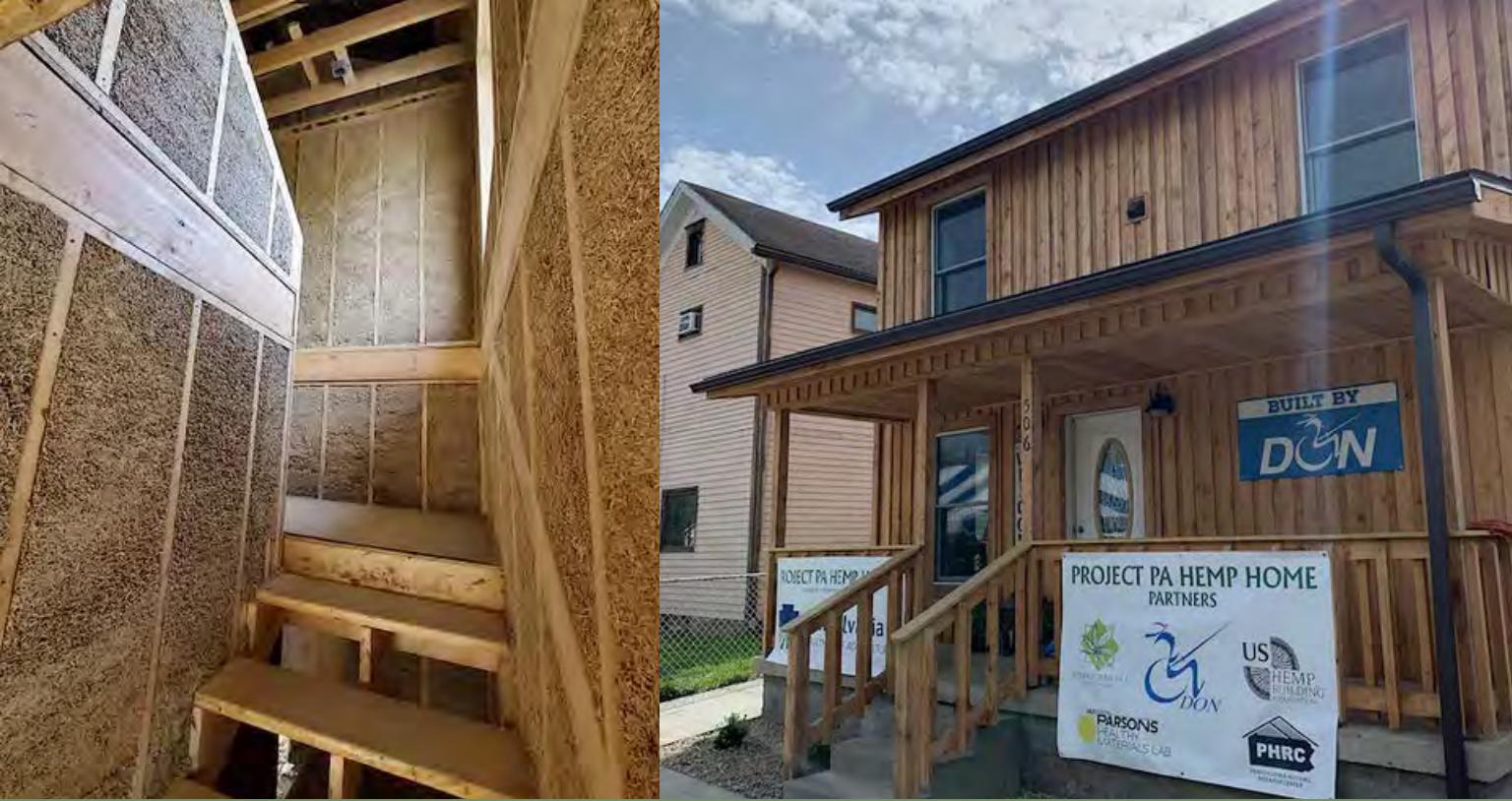
BUILDERS FOR CLIMATE ACTION



**AN ACCESSIBLE PATH TO
CARBON STORING
BUILDINGS IS THROUGH
THE USE OF BIOGENIC
MATERIALS...PLANTS!**



BUILDERS FOR CLIMATE ACTION



CARBON-STORING RENOVATIONS

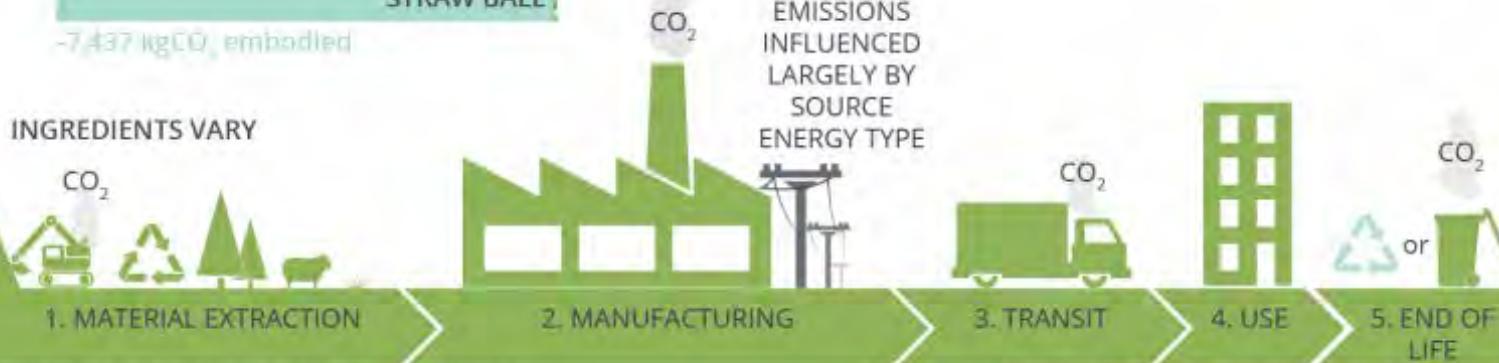
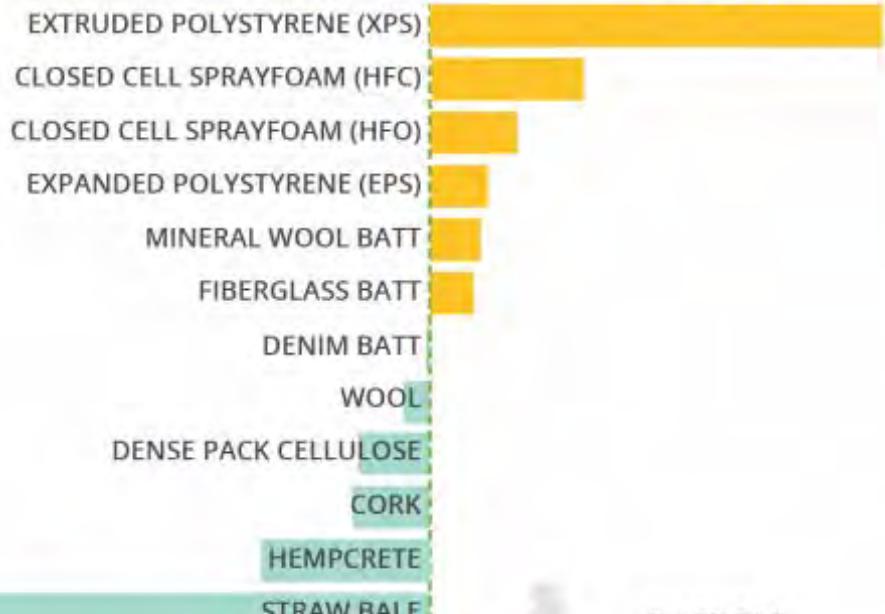
PA Hemp Home as a pilot project in New Castle, PA, executed in 2020 to research, test, and apply hempcrete insulation in the renovation of a 100 year-old blighted house.

The project was funded by a grant from the Pennsylvania Department of Agriculture to become an example of how industrial hemp can be used in building materials.

CARBON IMPACTS OF INSULATION

kgCO₂ represents R-20 at 234 m²

6,735 kgCO₂ emitted



Factors that Impact Individual Risk



Age



Gender



Race/Ethnicity



Socioeconomic Status



Geography



Genetics

Healthy Materials Lab

THE NEW SCHOOL
PARSONS

WHO IS IT AFFECTING?

"Longstanding and rising income inequality, combined with a history of racial residential segregation, has led to startling health inequalities between neighborhoods. Poor health outcomes tend to cluster in places that people of color call home and where many residents live in poverty."

- DR. MARY BASSETT, COMMISSIONER, NYC
DEPARTMENT OF HEALTH & MENTAL HYGIENE

HEALTHY HOUSING IS AN ESSENTIAL PART OF A HEALTHY COMMUNITY



RDBC MOBILE CLASSROOM & PLANNED PROGRAMS

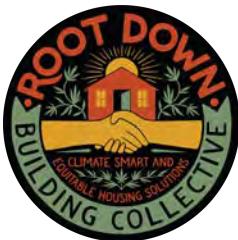
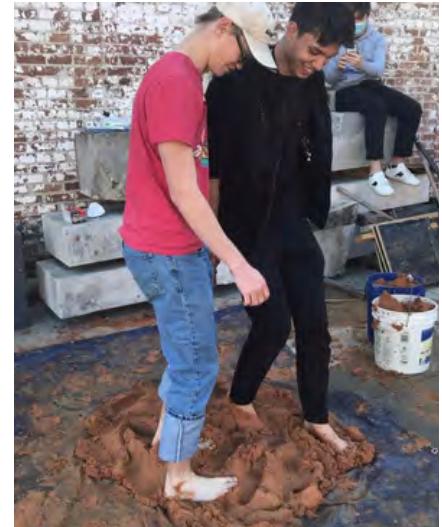


CURRENT PLANNED PROGRAMMING:

- MOBILE MUD KITCHENS (KIDS ONLY)
- KID-BUILT NATURAL PLAYHOUSE (KIDS ONLY)
- RAMMED EARTH & HEMPCRETE PLANTERS (KIDS & ADULTS)
- MINI PIZZA OVENS & COOKING (KIDS AND ADULTS)
- CUSTOMIZE YOUR WORKSHOP (KIDS, ADULTS, WOMENS GROUPS)

PROGRAM OVERVIEW:

The RDBC Mobile Classroom brings hand-on experience to adults and children across the region, while educating participants about climate-smart building methods, with an emphasis on protecting the natural resources of South Carolina. Trained facilitators (or experts in Climate-Smart, equitable housing) educate participants through a variety of programs, inspiring individuals and empowering communities. Community-style building and having fun is a necessity for learning! Many of these programs have been taught numerous times in many locations across the South. The demand for building workshops and classes designed to educate students about climate-smart materials & methods has grown rapidly, along with increasing awareness around climate change. All programming is taught from the RDBC Mobile Classroom, which allows us to meet a growing demand, and gain access to more communities. The RDBC mission is a scalable one, meant to be rippled out across South Carolina and beyond. Through our teacher training initiatives and our network of hubs and partners, we will teach, empower, and inspire communities across South Carolina and beyond!



COMMUNITY-BUILDING WORKSHOPS & SKILL BUILDING



PROJECT OVERVIEW:

The Charleston Healthy Housing Pilot Project will not only provide a proof of concept for scalable, healthy housing solutions, it will also provide numerous opportunities for skill building, workforce development, community-building and empowerment.

Lessons & courses ranging from weekend classes to longer apprentices for those pursuing new climate-smart construction trades will be a core part of this project. RDBC prioritizes marginalized demographics currently not represented in the construction industry through our scholarship program and intentional decision making.

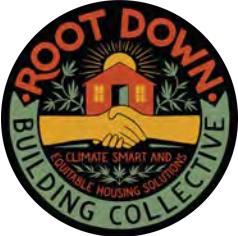
These images were taken from our Fall 2022 Charleston Hempcrete Building Workshop, located at The American College of Building Arts. This event brought 75 participants from across the country to participate in a 2-day hands-on building workshop with various forms of hemp building.

An ongoing waitlist continues to grow while we work to meet this extensive demand from those seeking new, healthy housing solutions.





ADVOCACY WORK & CONSULTING SERVICES



Root Down Building Collective is an SC-based 501c3 non-profit, charitable organization

The experience of our Executive Director, April Magill, is rooted in 12 years of operating a small architectural firm (Root Down Designs) - dedicated to sustainable architecture and affordable housing solutions. Through the

Root Down Building Collective, we are expanding our advocacy work geographically and in collaboration with regional allies, organizations, and municipalities to advance climate-smart, equitable housing solutions.

Our extensive understanding of the building and construction industry and the permitting process allows us to pinpoint where efficiencies can be made and what policies and codes will be beneficial to the advancement of healthy & affordable housing solutions.

RDBC is a community partner and an asset to local and regional policy makers and governments. Consulting services, presentations, and architectural services are available through our organization.

The development of pre-designed/engineered house and ADU plans are available for City & County pre-approval.





A PLAN TO REDUCE LEVELS OF EMBODIED CARBON





VANCOUVER STUDY

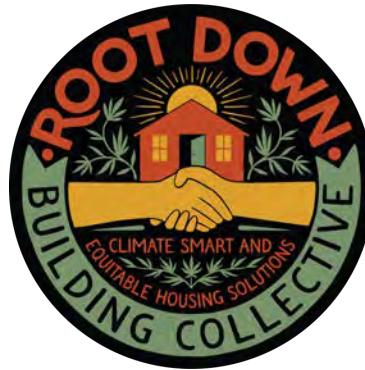
A benchmark study of material-related greenhouse gas emissions (embodied carbon) from new Part 9 homes in the city. The results of the benchmark study are to be used for engaging with stakeholders and to help determine tiers or thresholds for incentive programs and regulations to meet the city's climate action plan goal of reducing embodied carbon in buildings by 40% by 2030.

Read the full study [here!](#)



"HOUSING THAT PROVIDES FOR A DIGNIFIED HEALTHY, LIFE WITHOUT EXCESSIVE COST BURDENS IS FUNDAMENTAL TO A JUST AND EQUITABLE SOCIETY."

STAY CONNECTED!



[VISIT OUR
WEBSITE](#)



[FOLLOW ON
INSTAGRAM](#)



 **YouTube**
@rootdowndesigncollective



INFO@ROOTDOWNBUILDINGCOLLECTIVE.org

www.RootDownBuildingCollective.org

Public Comment Period