

TREVER RAE BELLEW

Associate AIA - M.Arch - Adjunct Professor, UDC

- ARCHITECTURAL DESIGN
- GIS / BIM INTEGRATION
- COMPUTATIONAL RESEARCH
- URBAN ANALYSIS
- SPATIAL MODELING

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CONTACT

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Full project image archives, including extended plate sets, are available at treverbellew.com.

00 // INTRODUCTION

I am interested in technically rigorous design roles that integrate architecture, planning, and data-driven decision-making — moving from conceptual logic to architectural execution.

This portfolio presents five selected projects spanning architectural design, urban analysis, civic infrastructure, cultural infrastructure, and computational research. Each is framed around a spatial problem, a structured method, and a resulting design output. Together they document a practice logic built on GIS/BIM integration, computational spatial analysis, and technical documentation - from individual buildings to 180-acre campus redevelopments.

This work exists at the crossroads of design authorship and analytical precision. Techniques such as probabilistic spatial modeling, Monte Carlo simulation, null-model testing, and parametric documentation are viewed not as final goals but as instruments for creating design decisions that are justifiable and based on solid evidence.

COMPUTATIONAL	DOCUMENTATION	DESIGN
GIS / PyQGIS	BIM / Revit / pyRevit	Spatial Strategy
Monte Carlo Simulation	Technical Drawings	Urban Analysis
Null-Model Testing	Systems Diagrams	Building Proposals
Python Pipelines	Spatial Plates	Adaptive Reuse
		Cultural Infrastructure

ON AI-ASSISTED VISUALIZATION

I hold this portfolio to the same standard I set for my students: method needs no disclosure, content needs verification, and anything presented as my work is work I did. Every plan, section, elevation, detail, diagram, and analysis in these pages is my own, developed in Revit, QGIS, Rhino, and Photoshop.

One stated exception: some photoreal renders use generative AI as the rendering engine. Each begins from my own line elevation, a detailed prompt, and my material specification, and is checked against its source drawing. These renders are labeled in their captions.

TE — 01

UDC Community Resilience Center

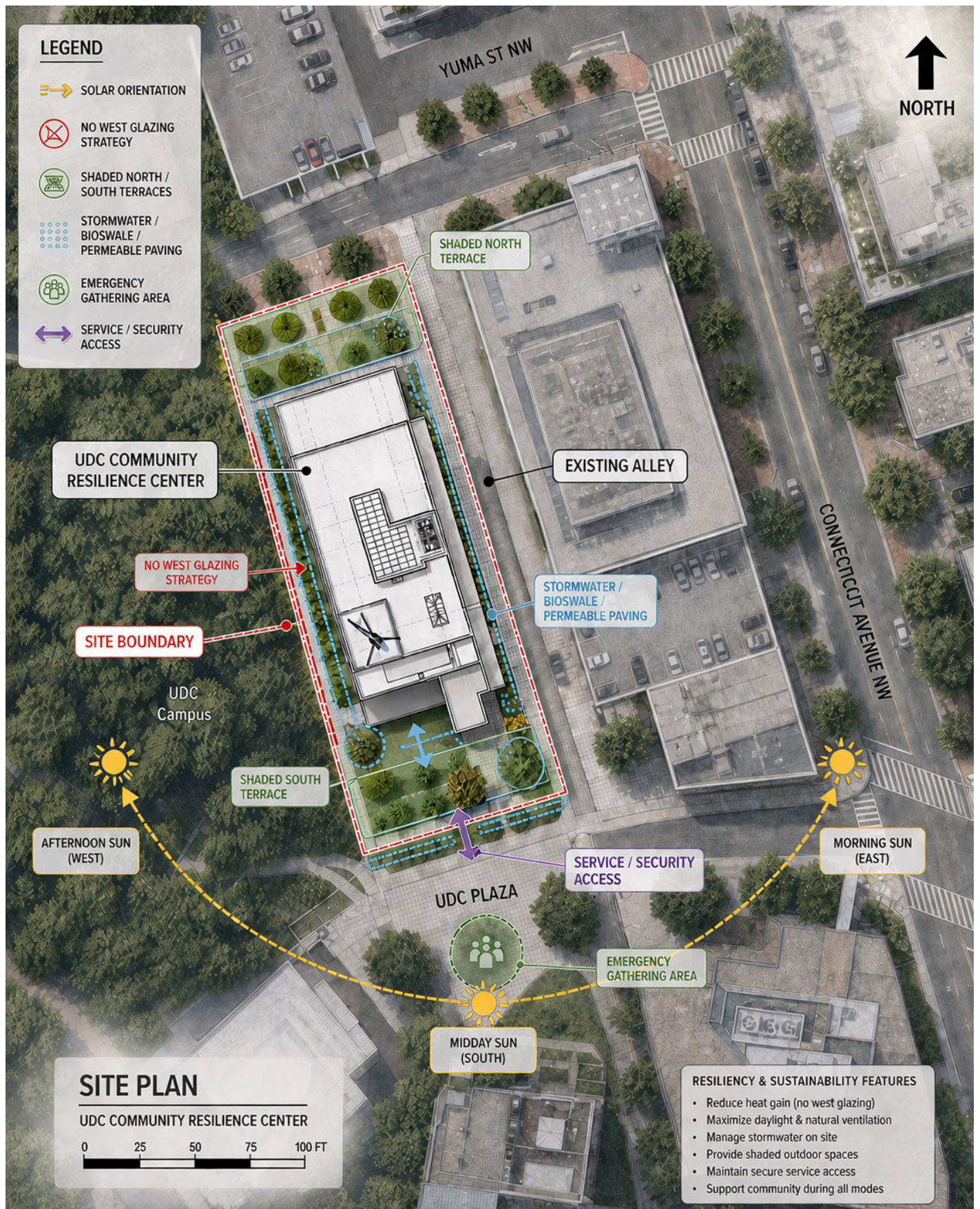
Civic Resilience & Sustainable Infrastructure



LOCATION	Washington, DC — UDC Campus
YEAR	2026
CATEGORY	Technical / Architectural Design
TOOLS	Revit, Twinmotion, Autodesk Insight, QGIS
ROLE	Architectural Designer & Technical Documenter
GROSS AREA	43,489 sq ft
ENERGY SYSTEM	Solar PV + Powerwall Backup, Geothermal
TARGET CERTIFICATION	LEED Gold (73 Pts), WELL Silver
PLATES	24 drawings / renders

PROBLEM	METHOD	OUTPUT
Community infrastructure needed to serve daily civic life while remaining useful during emergency conditions.	Organized program around Normal, Emergency, and Recovery modes with robust envelope and energy strategies.	Complete building proposal with plans, sections, renders, systems diagrams, and resilience logic.

Building Proposal · Mode Diagrams · Plans & Sections · Environmental Strategy · LEED



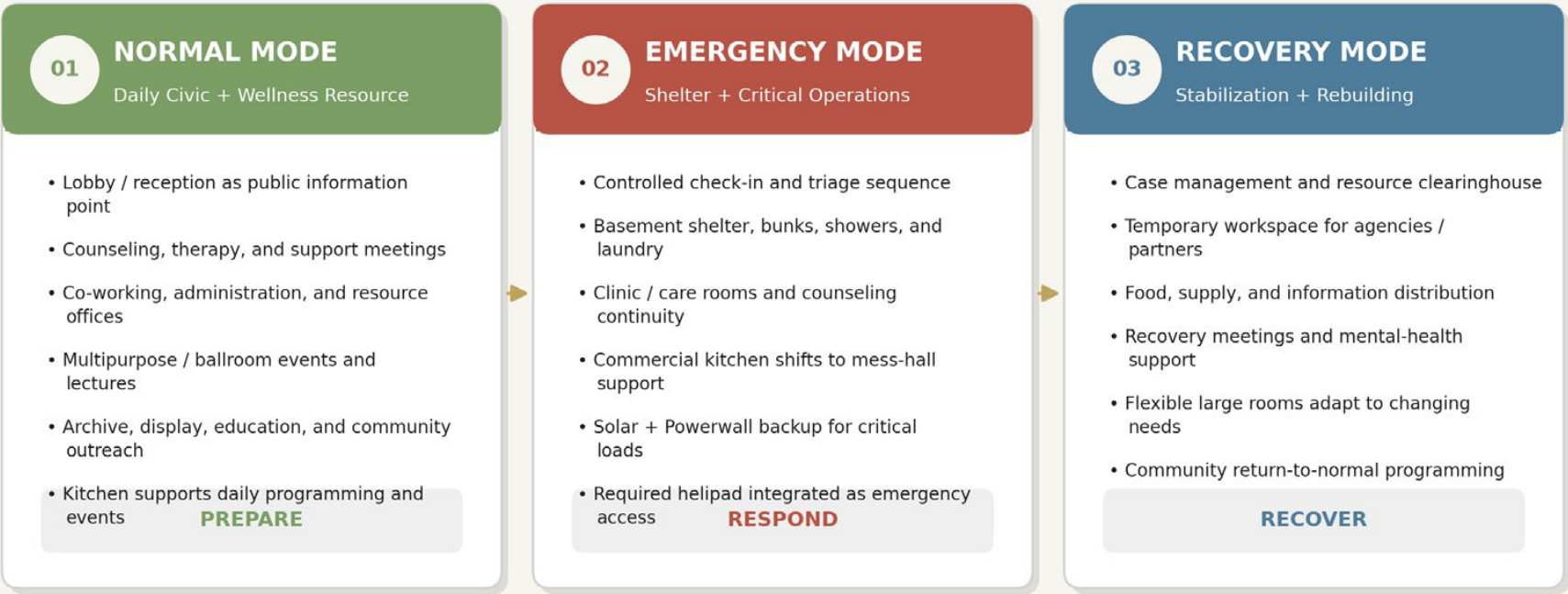
Site plan — building geometry from author's Revit model; site base from GIS mapping data; graphics by author.

SELECTED PLATES // RESILIENCE LOGIC

UDC COMMUNITY RESILIENCE CENTER

Normal / Emergency / Recovery Operating Modes

A daily civic resource designed to transform into protected emergency shelter and long-term recovery infrastructure.



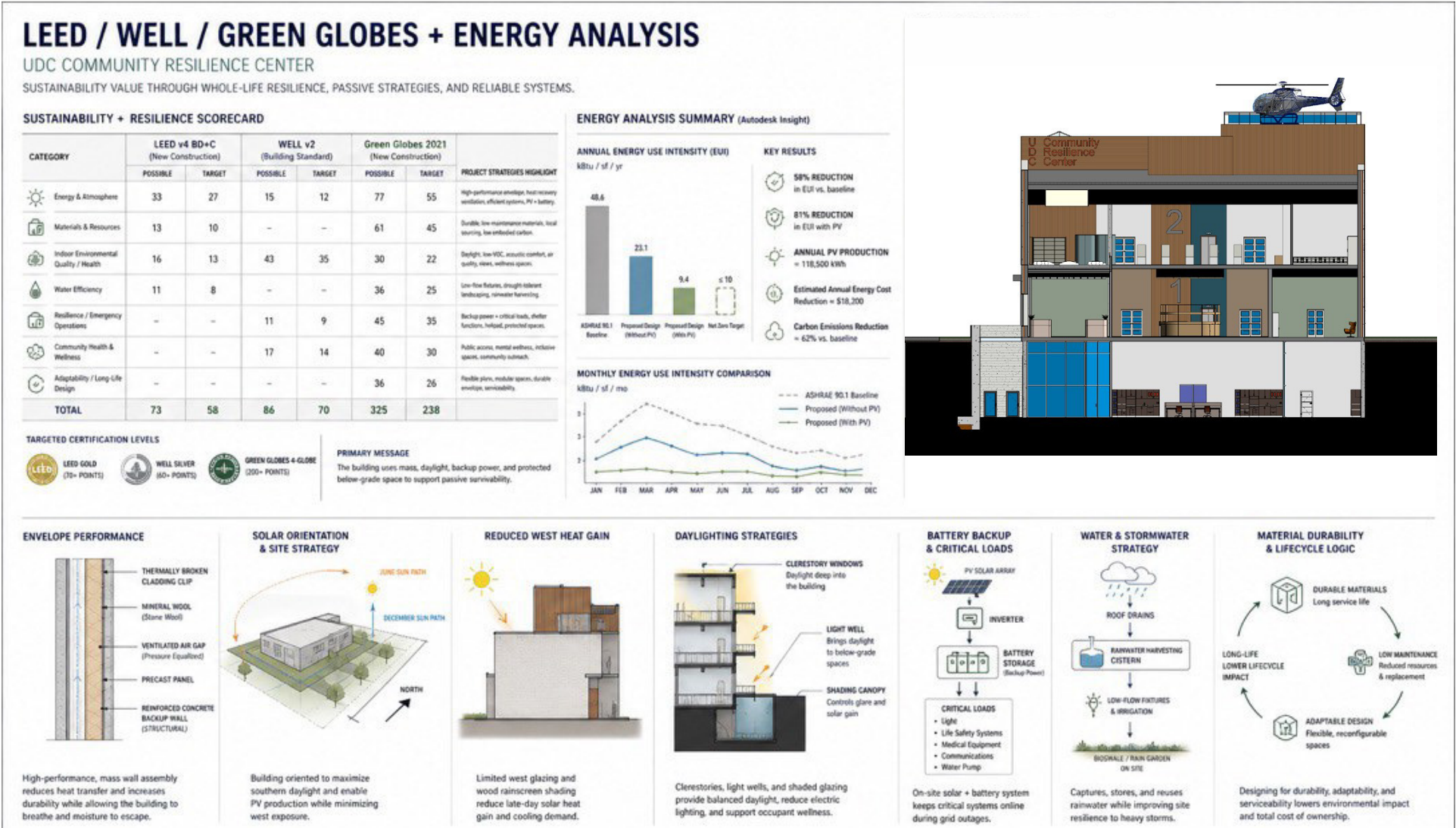
Daily use builds preparedness

Crisis response protects life + continuity

Recovery restores community capacity

Normal / Emergency / Recovery operating modes — UDC Community Resilience Center

SELECTED PLATES // ENVIRONMENTAL STRATEGY



SELECTED PLATES

FIG.01 LEVEL 1 FLOOR PLAN — MEASURED

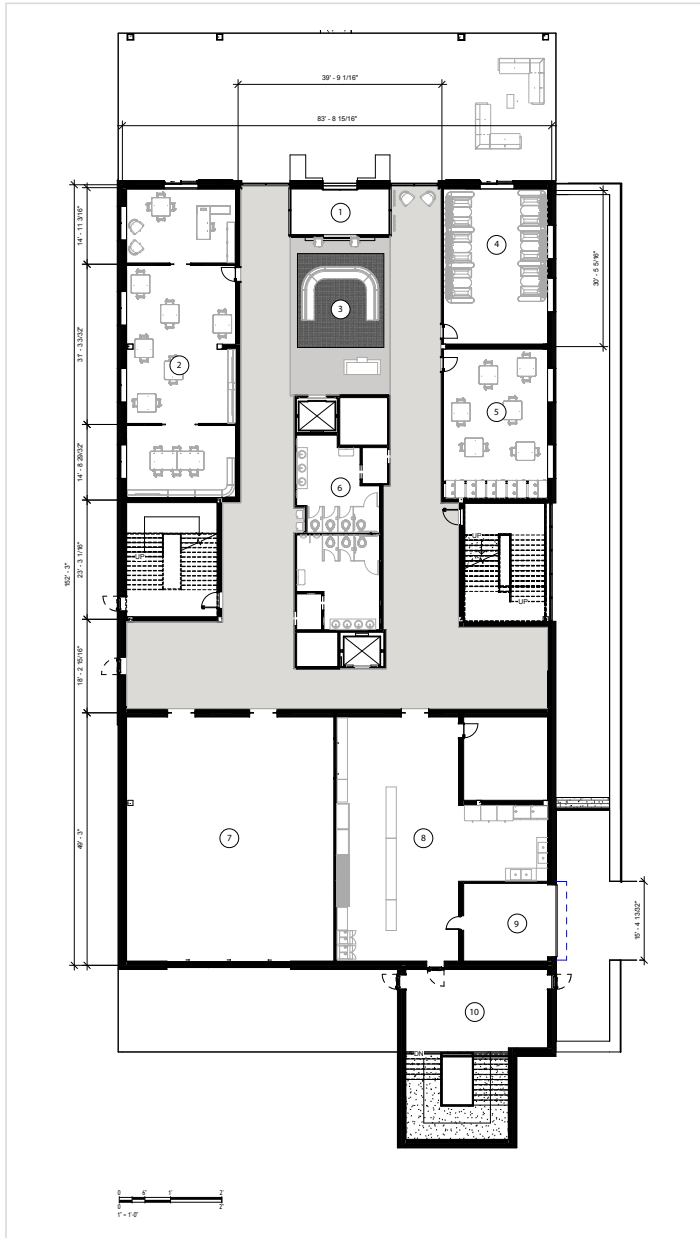
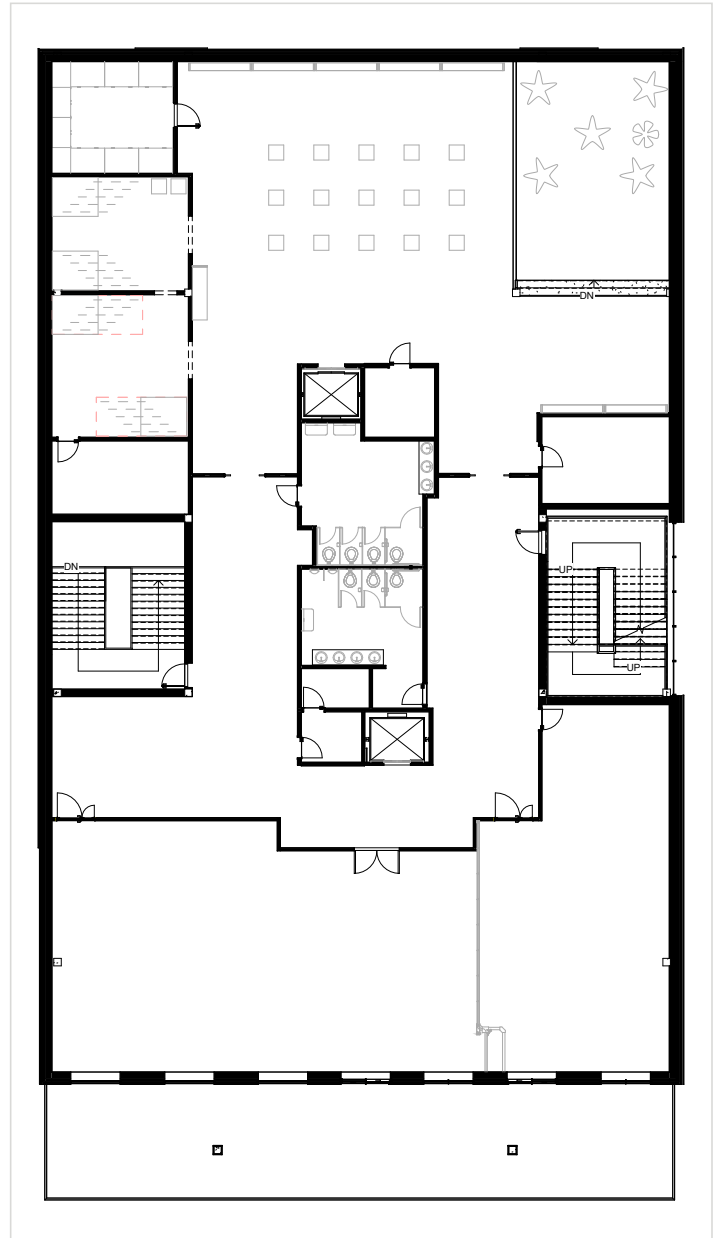


FIG.02 LEVEL 2 FLOOR PLAN



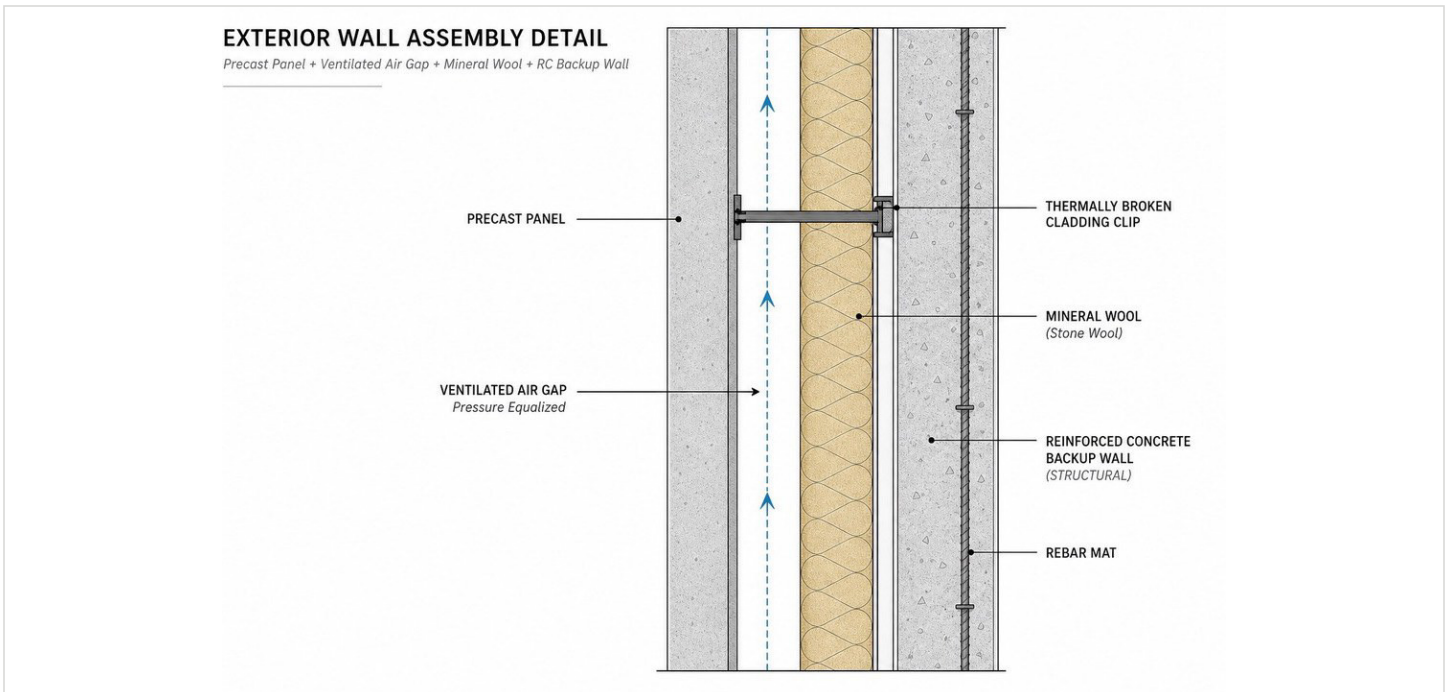
Selected plates from the UDC Community Resilience Center project archive. Full image archive available at treverbellew.com.

SELECTED PLATES

FIG.03 BUILDING SECTION (LOOKING EAST)



FIG.04 EXTERIOR WALL ASSEMBLY DETAIL



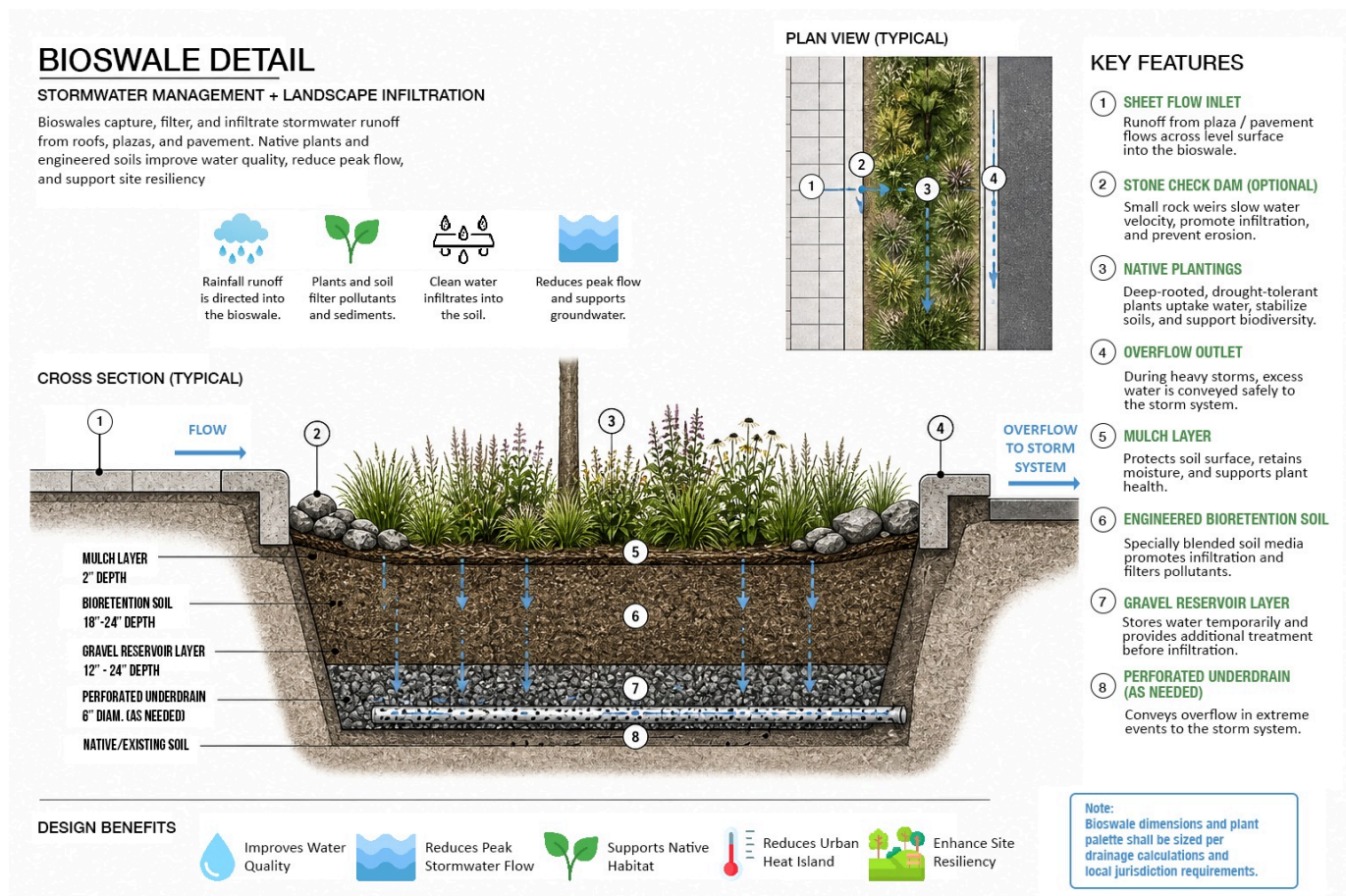
Selected plates from the UDC Community Resilience Center project archive. Full image archive available at treverbellew.com.

PROJECT NARRATIVE

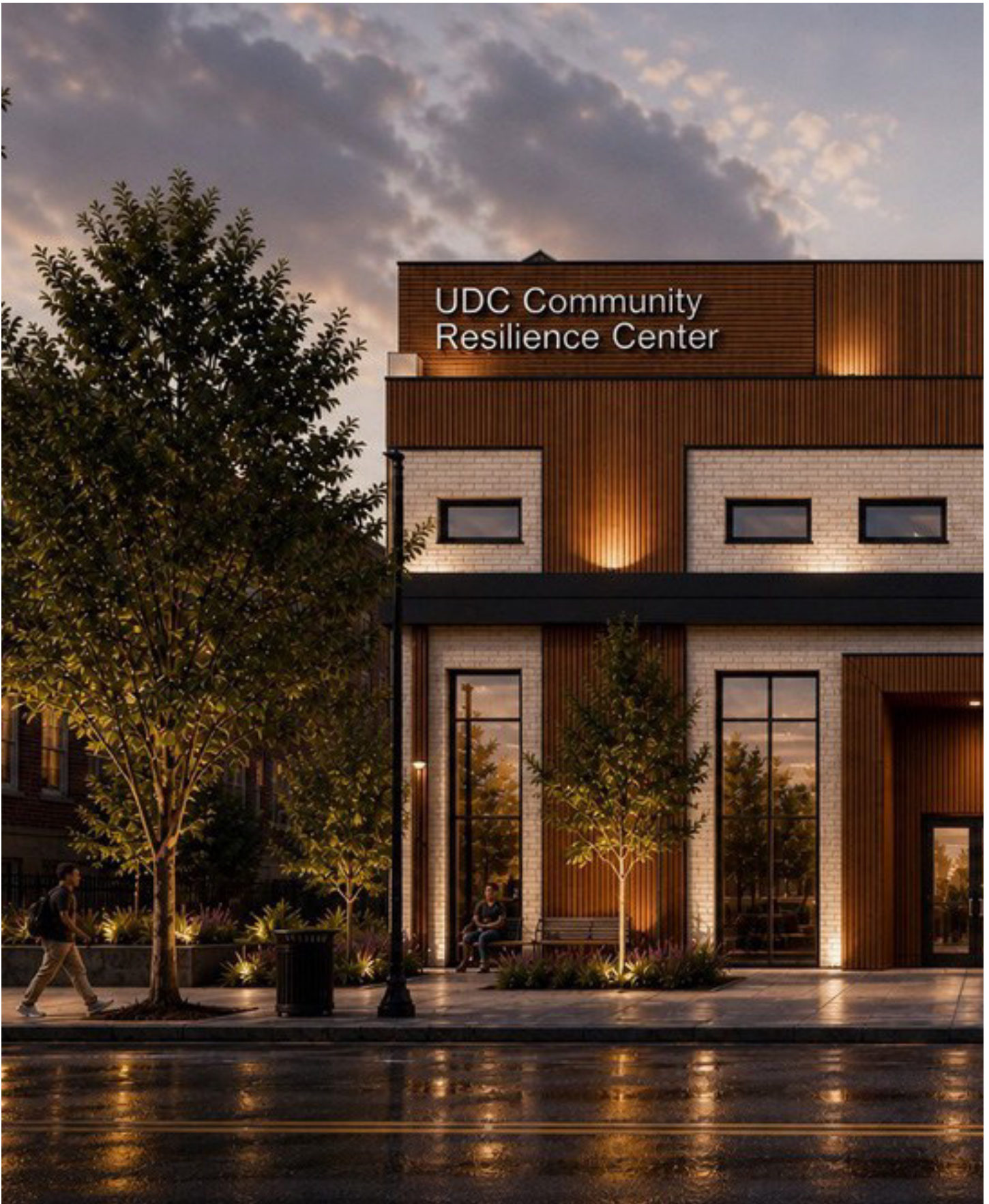
A long-life civic resilience facility that supports daily community wellness while converting into an emergency shelter and support hub during crisis conditions. The building is designed to transform into protected emergency shelter and long-term recovery infrastructure, utilizing robust materials and autonomous energy systems. The project developed a civic facility concept that connects everyday wellness programming with emergency shelter operations and resilient building systems.

DESIGN ANALYSIS

The project utilizes a modular programmatic logic that adapts between Normal, Emergency, and Recovery modes. Normal mode supports co-working, administrative functions, and public plaza activity. Emergency mode activates check-in/triage systems, care rooms, and resource clearinghouse operations. Recovery mode sustains temporary workspace and long-term stabilization programming. The facility integrates high-mass thermal envelopes, a Solar PV + Powerwall backup energy system, geothermal conditioning, and advanced bioretention systems to ensure survivability and operational continuity. At 43,489 sq ft, the building is designed to achieve LEED Gold (73 pts) and WELL Silver certification.



Bioswale detail — original graphic by author (Photoshop).





UR — 02

RFK Campus Redevelopment

Systemic Integration & Mixed-Use Density



LOCATION	Washington, DC — RFK Campus, Anacostia River
YEAR	2026
CATEGORY	Urban Design
TOOLS	QGIS, Revit, Illustrator, Gemini
ROLE	Lead Concept Author & Spatial Analyst — 8-person studio team
SITE AREA	180 Acres
TARGET DENSITY	36.1 units/acre
OPEN SPACE	>30% of site
PLATES	13 drawings / renders

PROBLEM	METHOD	OUTPUT
A large car-oriented superblock limited neighborhood access and underused riverfront land.	Mapped access gaps, density targets, open-space ratios, transit edges, and ecological constraints.	Mixed-use redevelopment proposal with diagrams, massing studies, and urban logic plates.

Master Plan · Density Strategy · Connectivity Diagrams · Phasing Studies · Urban Systems

SELECTED PLATES

FIG.01 LAND USE DIAGRAM

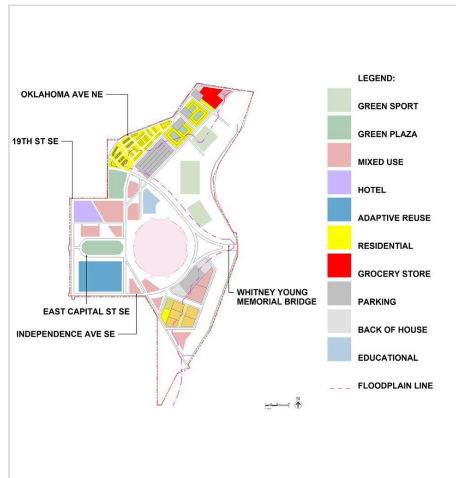


FIG.02 SITE CONTEXT OVERLAY

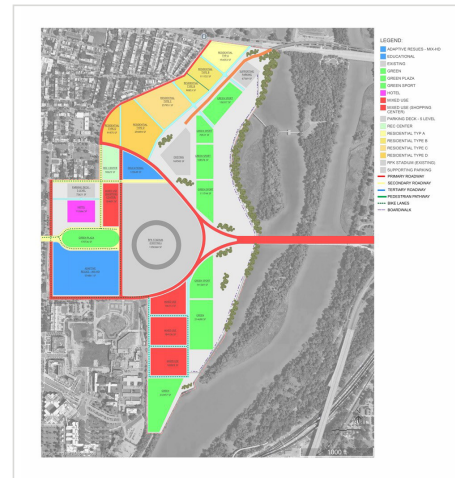


FIG.03 STREETScape STUDY



FIG.04 RIVERFRONT MASTER PLAN



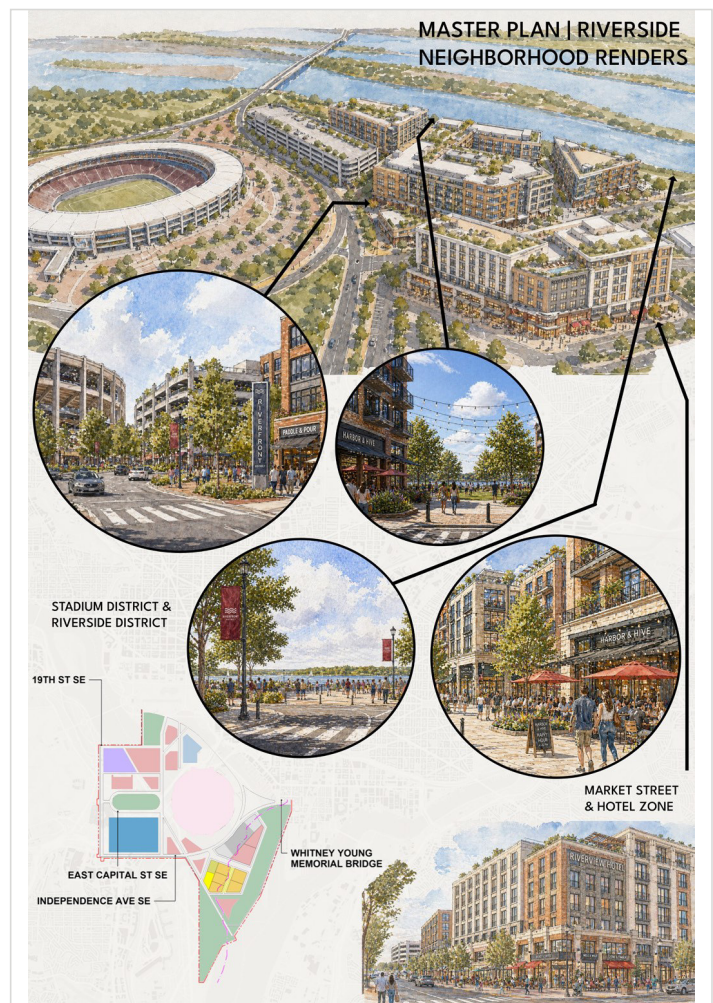
Selected plates from the RFK Campus Redevelopment project archive. Full image archive available at treverbellew.com.

PROJECT NARRATIVE

The RFK site operates as a disconnected superblock along the Anacostia River, historically defined by car-oriented access and limited neighborhood integration. This proposal restructures the site into a connected, mixed-use district by restoring permeability, integrating transit, and aligning density with public space and ecological constraints. The project converts an isolated stadium district into a connected mixed-use framework that balances density, open space, transit, and civic activity.

DESIGN ANALYSIS

Density is strategically concentrated within mixed-use zones to achieve a high overall target of 36.1 units/acre while preserving over 30% of the site as open space. The stadium is embedded within the urban fabric rather than isolated, enabling year-round activation and reinforcing connections to adjacent neighborhoods. Three logic circuits guided the design: restoring the neighborhood grid from superblock isolation; replacing service gaps with mixed-use clustering; and converting the stadium from an isolated urban object to a continuous-activity civic anchor. Connectivity diagrams and phasing studies document how the transition from current conditions to the proposed framework can be sequenced incrementally. The proposal was developed by an eight-person design team; I authored the core concept and the three logic circuits described above. The plates shown here are limited to graphics I produced.



TE — 03

Restoring the Jewish Temple: A Spatial Study

BIM/GIS Integration & Historical Reconstruction



LOCATION	Jerusalem
YEAR	2025 – 2026
CATEGORY	M.Arch Thesis — 1st Place Honors / Technical Research
TOOLS	Revit, pyRevit, QGIS, PyQGIS, Python, Twinmotion
ROLE	Researcher, Designer, BIM/GIS Modeler
COORDINATE SYSTEM	EPSG:32636 — WGS 84 / UTM Zone 36N
SCALE	Site-wide precinct analysis
PLATES	26 drawings / renders

PROBLEM	METHOD	OUTPUT
Historical reconstruction required aligning uncertain archaeological evidence with architectural precision.	Combined BIM modeling, GIS control data, Monte Carlo testing, and iterative drawing studies.	Documented spatial model, analytical diagrams, and a navigable image archive spanning 26 plates.

Spatial Reconstruction · GIS Alignment Study · Monte Carlo · Technical Plates · BIM

SELECTED PLATES

FIG.01 MONTE CARLO AXIS ALIGNMENT

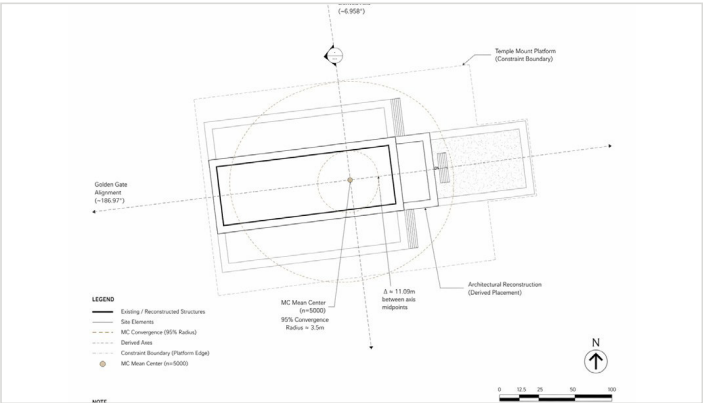


FIG.02 CUBIT-BASED FOOTPRINT STUDY

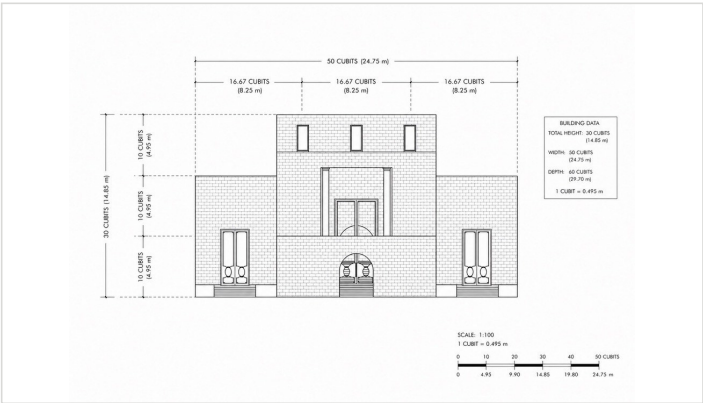


FIG.03 LONGITUDINAL BUILDING SECTION

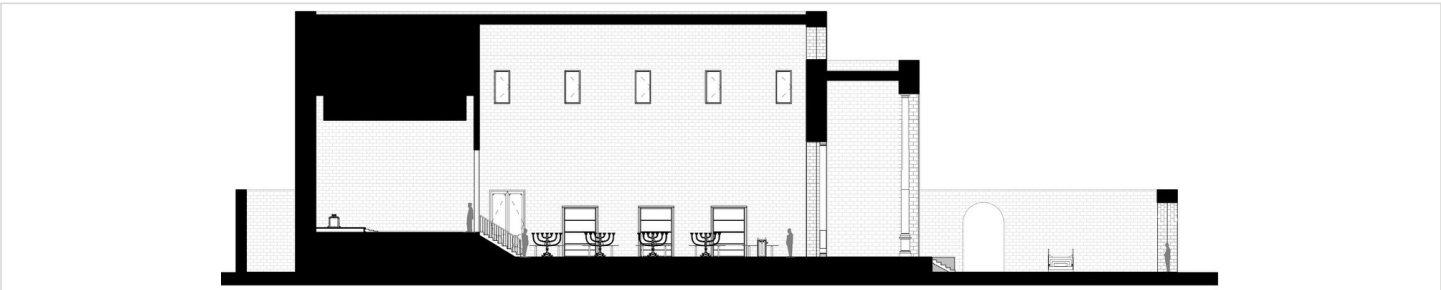


FIG.04 PORTAL CROSS-SECTION

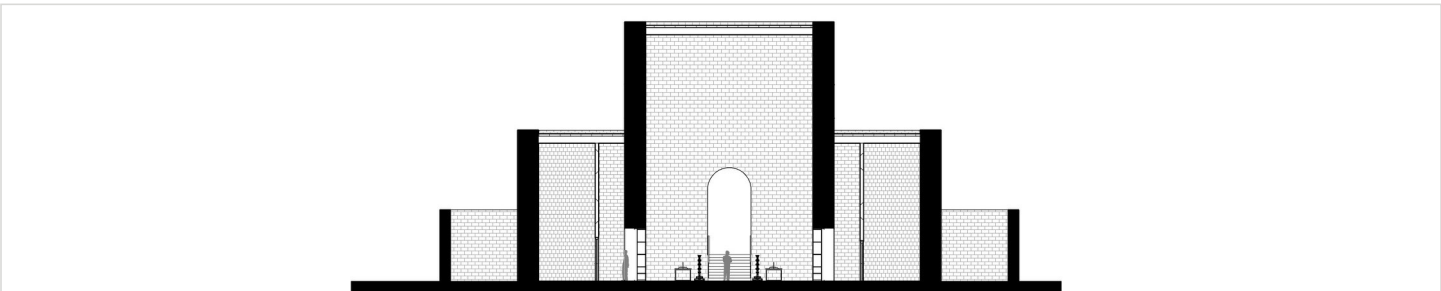


FIG.05 FRONT ELEVATION RENDER



FIG.06 SITE PLAN VIEW



PROJECT NARRATIVE

A comprehensive spatial study focused on the restoration of the Jewish Temple, integrating BIM workflows with GIS analysis to reconstruct complex historical and architectural systems. Rather than beginning with a predetermined placement or relying solely on inherited reconstruction traditions, the project translated textual, historical, archaeological, and architectural evidence into a testable geospatial framework. The goal was not to prove a final historical location, but to determine whether measurable spatial relationships on the existing platform produced a statistically meaningful convergence pattern when tested against uncertainty.

DESIGN ANALYSIS

The computational process was grounded in QGIS and PyQGIS with all geometry consolidated into EPSG:32636 (WGS 84 / UTM Zone 36N). The core spatial model centered on an east-west axial framework anchored to the Eastern / Golden Gate condition, testing relationships between the Temple Mount enclosure, the Golden Gate, the Dome of the Rock, the Dome of the Spirits, and derived control lines. A five-stage workflow moved through data preparation, observed-model construction, Monte Carlo uncertainty modeling, null-orientation comparison, and leave-one-out sensitivity testing. Dual-environment validation — primary construction in QGIS/PyQGIS, independent retest in a Python repository — reduced the risk of results being artifacts of the GIS session. The computational output identified a tightly constrained candidate region where multiple independent architectural constraints converged more tightly than randomized orientation models. Final architectural translation produced parametric cubit-based overlays, temple footprint studies, altar offsets, and processional axis diagrams.



AR — 04

Music as Architecture: Performing Arts & Dance Center

Cultural Infrastructure & Phenomenological Form Generation



Hero render — AI-rendered from the author's south elevation (FIG.04, p.22); prompt and material palette by author.

LOCATION	Washington, DC — UDC Campus
CONTEXT	Undergraduate Studio (Revised)
CATEGORY	Architectural Design
TOOLS	Revit, Twinmotion, Adobe Creative Suite, Physical Modeling
ROLE	Architectural Designer
PROGRAM	Performing Arts, Black Box Theater, Campus Café, Public Roof Terrace
SITE CONDITION	Sloped terrain bridging upper and lower campus
PLATES	Drawings, physical models, and renders

PROBLEM	METHOD	OUTPUT
The sloped campus amphitheater zone lacked an integrated, weatherproof indoor-outdoor performing arts facility.	Translated the rhythmic and acoustic structure of a musical composition into massing, folded roof geometry, and terraced landscape connections.	Multi-level plans, longitudinal and cross sections, physical concept models, and day / night exterior and interior renders.

Cultural Infrastructure · Black Box Theater · Folded Roof Geometry · Terraced Landscape · Public Roof Terrace

SELECTED PLATES

FIG.01 SITE PLAN — CAMPUS APPROACH



FIG.02 SITE DIAGRAM — FOOTPRINT & TERRAIN

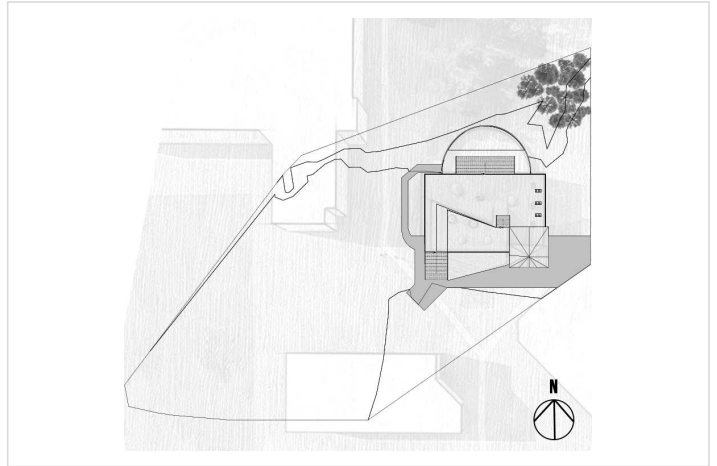
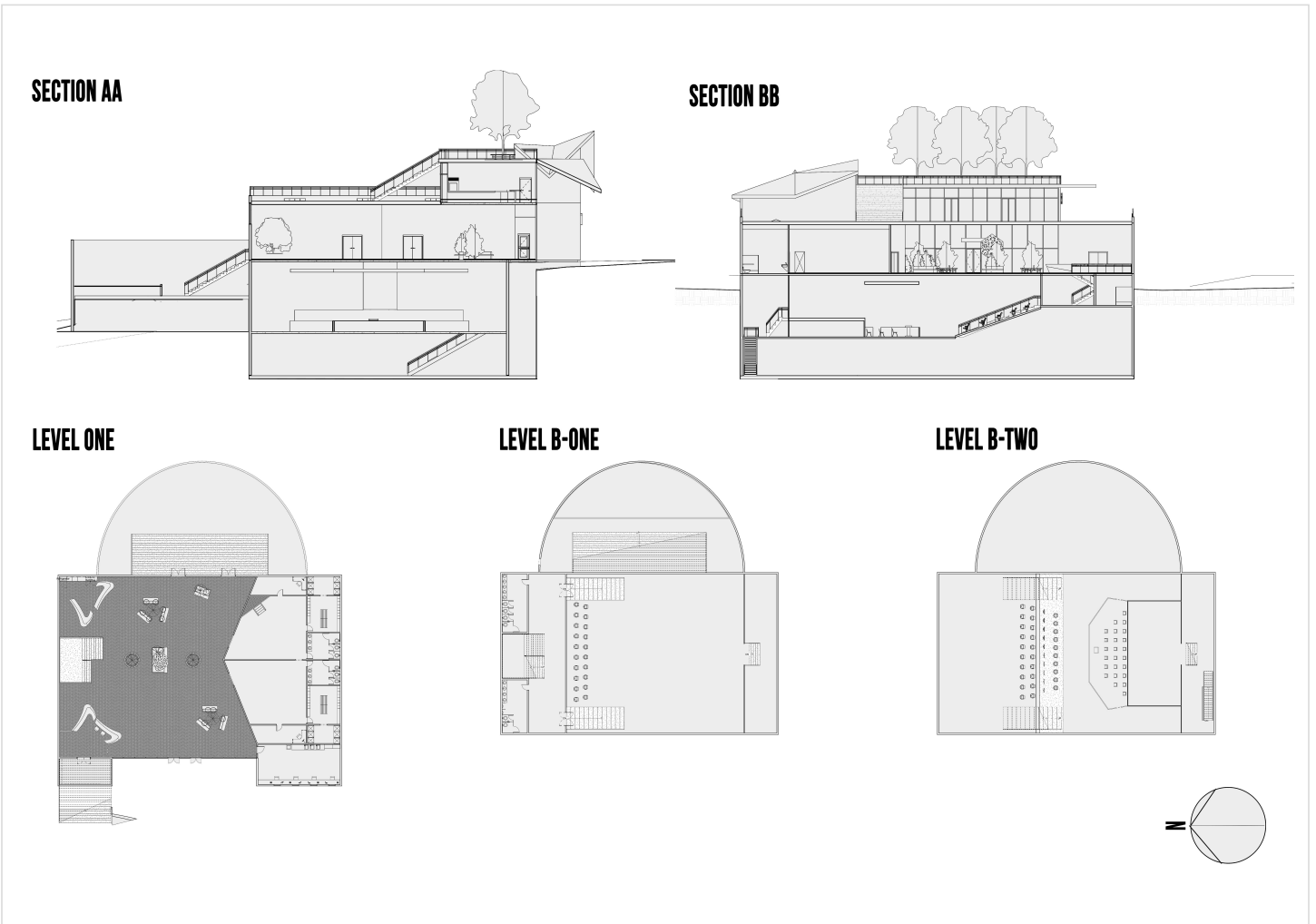


FIG.03 SECTIONS AA / BB & LEVEL PLANS



Selected plates from the Music as Architecture project archive. Full image archive available at treverbellew.com.

PROJECT NARRATIVE

A cultural and performing arts center designed to materialize musical rhythm and spatial movement into built form. Sited on the sloped terrain of the UDC campus, the project establishes a continuous civic sequence that links outdoor landscape activity with enclosed rehearsal space, a subterranean black box theater, and an expansive public roof terrace. The design treats architecture as an extension of auditory experience, balancing performative expression with functional clarity while bridging upper and lower campus circulation.

DESIGN ANALYSIS

The spatial organization is structured around a multi-tier vertical hierarchy. Subterranean levels house the primary performance space — a flexible black box theater with direct stage access, undercroft, and mechanical support — while grade-level zones anchor public entry, ticketing, and a campus-facing cafe. The upper roof plane doubles as active public realm and viewing terrace, connected to the ground by a monumental exterior stair. Formal generation was driven by the rhythmic, acoustic, and emotional structure of a specific musical composition (Billie Eilish and Khalid, “Lovely”), translated into massing strategy, folding roof geometry, and terraced landscape connections. The resulting folded roof planes and slatted timber facades echo rhythmic cadence, converting a topographical constraint into an expressive civic gateway.



SELECTED PLATES

FIG.04 SOUTH ELEVATION — ENTRY & TICKETING

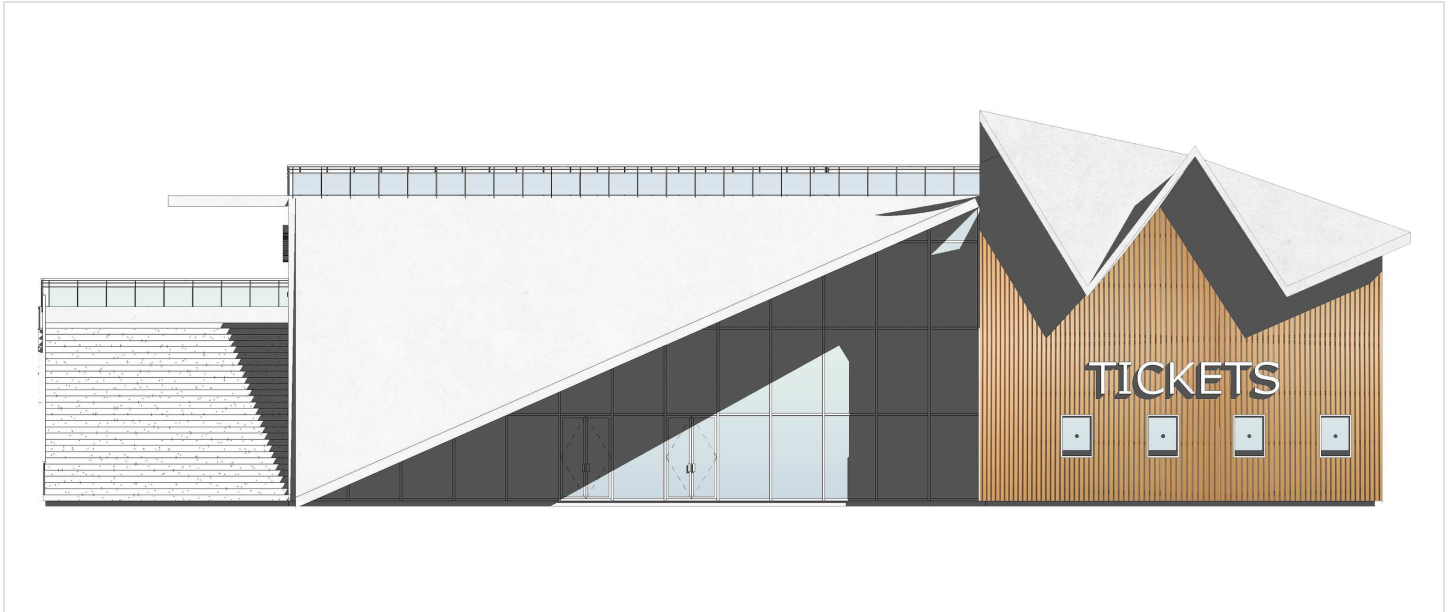


FIG.05 SOUTH ELEVATION — MATERIAL & LIGHT STUDY

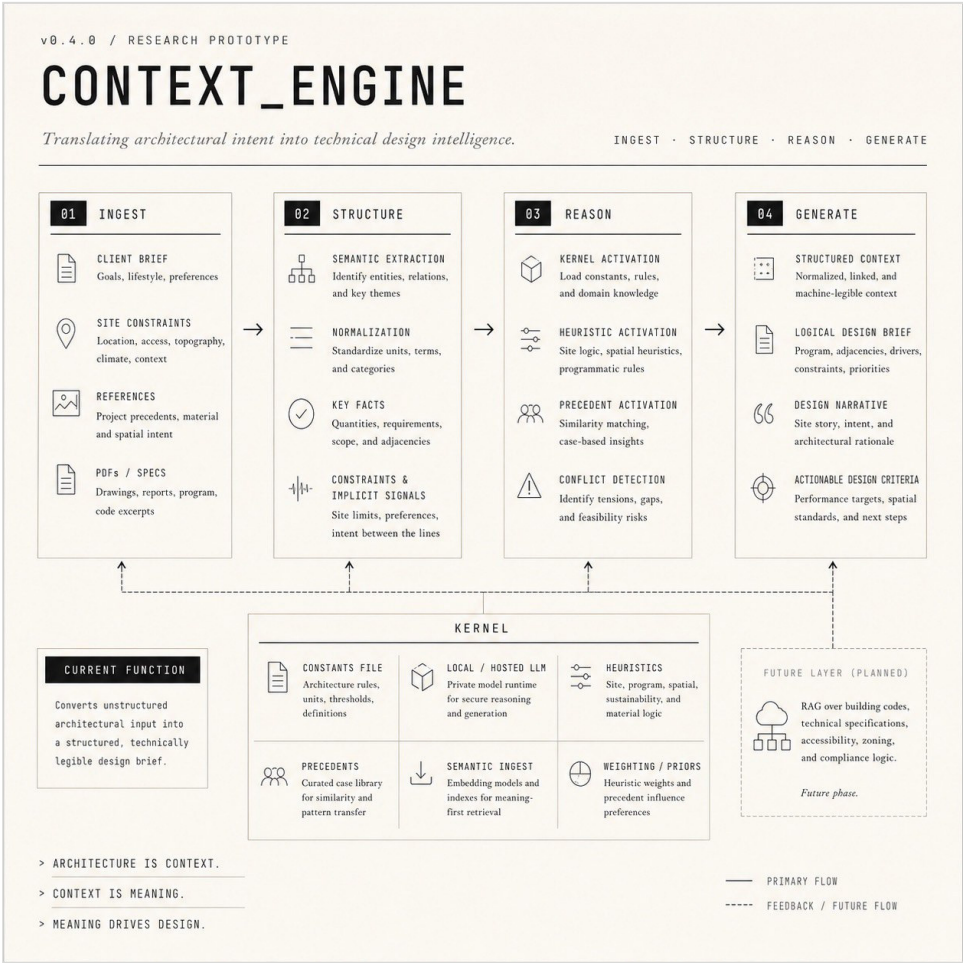


Orthographic elevation and matched render study — folded roof geometry and slatted timber facade.

CE — 05

Context_Engine

Computational Design Research — LLM Context Orchestration for Architects



Context_Engine is a local-first app focused on architectural reasoning. It transforms unstructured context — client briefs, site descriptions, reference notes, plan images, maps, sketches, drawings, and PDF metadata — into structured, text-based design intelligence, governed by a human-curated kernel of constants, precedents, and heuristics.

VERSION	v0.4.0 (Research Prototype)
CATEGORY	Software / Computational Design Research
TOOLS	Python, Local LLM Runtime, Next.js, JSON Schema Design
ROLE	Sole Developer
STATUS	Active Development
VALIDATION	Structured test-case suite (selected case follows)

LLM Orchestration · Architectural Reasoning · Kernel-Based Heuristics · Structured Generation · Test-Driven Validation

TEST CASE 01 // DIAGNOSTIC

Flagship Café / Roastery Fit-Out

Historic Downtown Savannah, GA · 4,500 SF Corner Lot · Kernel v0.4.0

INPUT

Size: 4,500 sq. ft. commercial footprint. Location: Historic downtown district in Savannah, Georgia, situated on a high-traffic pedestrian corner. Site Context: Flat corner lot with strict historic preservation guidelines, zero-lot lines, and zero on-site vehicle parking. Client: Local specialty coffee roaster and bakery looking to expand into a flagship cafe. Lifestyle/Operations: High-volume daytime foot traffic requiring dual assembly lines for mobile orders and dine-in guests, plus early morning delivery logistics via the side alley. Key Needs: Historic Board-approved exterior signage, commercial-grade grease trap interceptor, specialized HVAC for heat-generating coffee roasters, and ADA-compliant gender-neutral restrooms. Aesthetic: “Industrial Heritage” preserving original exposed brick walls, paired with modern brass accents, terrazzo flooring, and large steel-framed windows.

EXTRACTED CONCEPTS

Corner lot · Zero lot line · Flat site · Historic district · Preservation guidelines · No on-site parking · High pedestrian traffic · Coffee roaster cafe · Dual service lines · Alley delivery access · Industrial heritage aesthetic · ADA restrooms

KERNEL PRIORS FIRED

h_acoustic_buffer score 0.80

When a noisy edge exists (street, rail, highway), the building's service spine should buffer the quiet program from the noise source.

No precedents fired.

STRUCTURED CONTEXT

SUBJECT

- Flagship café/roastery fit-out, 4,500 SF commercial, historic downtown Savannah, GA

KEY FACTS

- Corner lot, high pedestrian volume, zero-lot-line condition
- Dual service lines: mobile order + dine-in, simultaneous peak operation
- Early AM delivery via side alley — only service access point
- Terrazzo floors, steel-framed windows, brass accents specified by client

CONSTRAINTS

- Historic Preservation Board jurisdiction over signage, fenestration, facade materials
- Zero on-site parking — pure pedestrian ingress/egress
- Commercial grease trap interceptor — coordination with municipal sewer connection
- ADA compliance: gender-neutral restroom(s), accessible path on corner site

TEST CASE 01 // OUTPUT

1. READING

This is not primarily a café problem. It is a mechanical-thermal-logistical problem that café experience is built around.

The roaster is the generator — spatially, atmospherically, economically. It produces BTU loads that demand exhaust volumes likely exceeding what the Historic Preservation Board will readily permit through the roof plane. It produces weight concentrations that demand structural assessment of the existing slab and framing bays. Every planning decision downstream of its placement is a consequence of its placement.

The corner condition amplifies this. Two street elevations means double exposure, but it also means the grease trap, service door, and MEP penetrations are forced into the alley elevation — functionally the building's third face and practically its most complicated one.

The high-confidence acoustic prior is directly activated here: the two street-facing elevations carry the noise load. The service spine should be positioned to buffer the quieter seating zones from those edges (h_acoustic_buffer applied). In a corner building, the service bar and equipment mass migrate toward the corner intersection — the loudest point — and the seating field opens rearward toward the calmer interior elevations.

The Historic Board is not a constraint to be managed at the end — it is a scheduling mechanism. The construction schedule is hostage to that approval process.

2. MOVES

MOVE 1 — Anchor the Roaster at the Corner, Compress the Bar Against It

Place the production roaster at or near the corner mass — the highest-traffic, highest-noise, highest-visibility node. This positions the exhaust penetration at the corner parapet where mechanical coordination is most defensible structurally, turns the roaster into the corner's visual anchor for both street elevations, and satisfies the acoustic buffer logic by placing the densest equipment mass at the loudest edge. The bar counter wraps from this anchor in an L or shallow C configuration. No back wall is wasted — the roaster is the back wall.

MOVE 2 — Split the Counter into Two Discrete Lanes with a Hard Spatial Seam

The mobile order pickup zone and the dine-in order/wait zone cannot share a counter edge without creating a collision pattern at peak. Separate them with a physical gap — a 36" to 48" break occupied by a display case, a structural column, or a storage element in blackened steel and brass. Mobile customers approach, collect, and exit without penetrating the dine-in zone; dine-in customers migrate toward the interior. The geometry is choreographic, not cosmetic.

MOVE 3 — Compress All Service Infrastructure Against the Alley Wall

Grease trap cleanout, MEP chases, roaster makeup air intake, and the delivery receiving area all belong to the alley elevation. Design a service spine — approximately 10 to 14 feet deep — running the length of the alley wall, containing the grease interceptor vault, the roaster exhaust duct chase, makeup air louvers, the walk-in cooler, dry storage, and the utility corridor. Nothing from this infrastructure touches the two public street elevations.

TEST CASE 01 // OUTPUT (CONTINUED)

MOVE 4 — Use the Terrazzo as a Zoning Device, Not Just a Finish

Terrazzo is expensive and the client has specified it — make it earn its cost spatially. Use two terrazzo fields with differentiated aggregate color or brass-strip dividers to delineate the mobile lane from the dine-in zone at floor level, continuing the spatial seam from Move 2 downward. In the seating field, shift to a third terrazzo variant or allow the existing brick floor to emerge, marking the transition from production to dwelling.

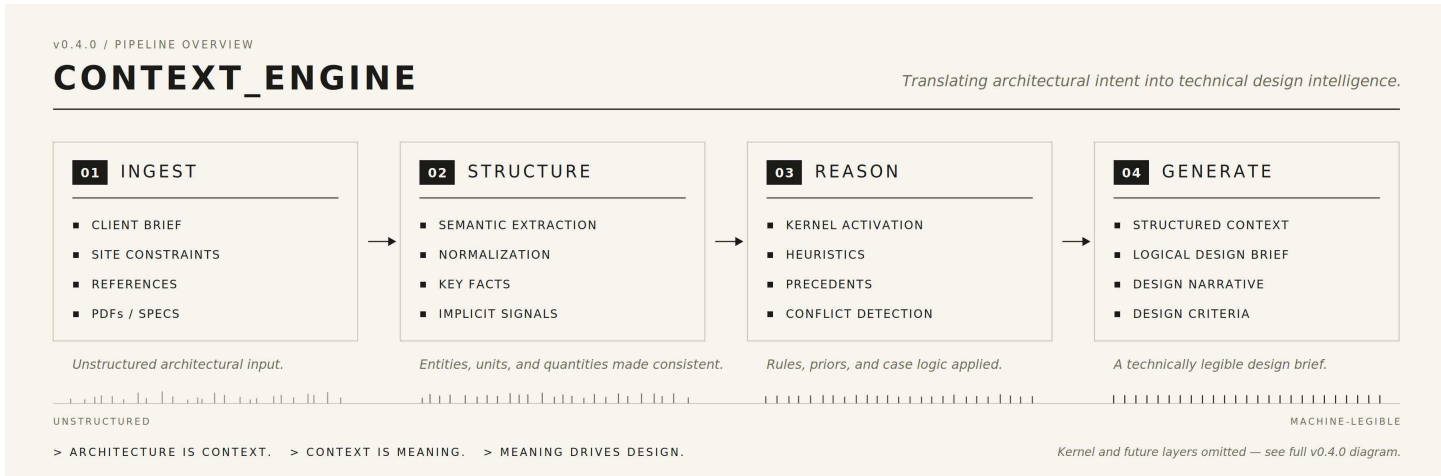
MOVE 5 — Negotiate the Roof Penetration as a Historic Board Submission Strategy

The roaster exhaust stack is the highest-risk approval item — it will penetrate the roof plane and may read above the parapet. Engage the HPB submission with a masonry-clad or painted steel stack designed to read as a flue or industrial chimney, both historically precedented in Savannah's commercial typology. This is not camouflage; it is contextual argument.

CONSTRAINT TRACEABILITY

Acoustic buffer heuristic (h_acoustic_buffer)	Move 1 — equipment mass anchored at the loudest corner edge
Zero on-site parking / pedestrian corner site	Move 1 — corner placement maximizes pedestrian-facing visibility
Dual mobile + dine-in service lines	Move 2 — hard spatial seam separates the two flows
Grease trap, MEP & delivery coordination	Move 3 — consolidated service spine along the alley wall
Client-specified terrazzo finish	Move 4 — terrazzo repurposed as a wayfinding / zoning device
Historic Preservation Board jurisdiction	Move 5 — exhaust stack designed as a contextual submission

Full kernel trace, including precedent matches and conflict-detection notes for this test case, is available in the underlying Context_Engine session log.



TREVER RAE BELLEW

Associate AIA — M.Arch — University of the District of Columbia, 2026

I completed my Master of Architecture at the University of the District of Columbia in 2026. My work integrates architectural design, GIS-based spatial analysis, BIM workflows, computational research, and technical documentation across projects ranging from individual buildings to district-scale planning.

PROFESSIONAL EXPERIENCE

Adjunct Professor - Architecture History & Theory

Washington, DC // 2026 – Present

Revamped the History and Theory of Architecture curriculum to focus on critical inquiry, evidence-based analysis, and discussion-driven learning. Created a non-teleological framework examining architectural traditions within their specific historical, cultural, and technological contexts, avoiding linear progressions toward modernity.

Freelance Design & Consulting

Washington, DC // 2022 – Present

Architectural and site-based design proposals integrating spatial analysis and contextual constraints. Feasibility studies and site analysis reports for development and preservation-focused projects.

Archaeological Field School

Tel Hanaton & Tel Azekah, Israel // 2025

Conducted systematic fieldwork involving site planning, excavation, stratigraphic documentation, and spatial recording. Utilized surveying and mapping methods to capture site conditions accurately.

Licensed Realtor®

Washington, DC // 2016 – 2025

Executed thorough site and property assessments to evaluate potential for development, recognize challenges, and identify spatial advantages. Interpreted zoning requirements, market dynamics, and site-specific characteristics.

EDUCATION

M.Arch — University of the District of Columbia
2026

B.S. Architecture — University of the District of Columbia (Cum Laude)
2024

A.A.S. Architectural Engineering Technology — University of the District of Columbia (Honors)
2022

TECHNICAL CAPABILITIES

ARCHITECTURAL & TECHNICAL

Architectural Design / Spatial Planning / Technical Drawing / Documentation / Site Analysis

COMPUTATIONAL & ANALYTICAL

GIS (QGIS, PyQGIS) / Data-driven Design / Spatial Modeling / Python / TypeScript / Local LLM Development

SOFTWARE

Revit / SketchUp / Twinmotion / Rhino / Enscape / VS Code / Adobe Creative Suite / Microsoft Office / Terminal / Autodesk Forma

CREDENTIALS & HONORS

Master's Thesis 1st Place Honors
National Society of Leadership & Success
Tau Sigma Delta - Architecture Honor Society
Associate AIA
NCARB Record Holder

DESIGN PROCESS

An iterative methodology for transforming spatial evidence into buildable architecture.

