

## Low Country Line: Sited House

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### HOUSE + MATERIAL

Material is the media of architecture. It is a physical expression of context and culture. Its intrinsic qualities and limitations determine the approach to design and form. It has the ability to define architecture. With specific dimension, weight, and technical qualities, a material directs a design process. As the foundational premise of making, material influences all else. This project examines the influence of material on architecture through the Low-Country Line House in North Georgia. This project illustrates how a vernacular material and building construction influences design. Examining the influence of: form, cost, methods of construction, fabrication of product, installation of materials, structural and aesthetic performance, ecological and sustainable impact, and spatial/light/visual impact this project provides an analytical process for the implementation of the potential of a material.



Historical maps of North Georgia

The Low Country Line house emerges from the climatic conditions of a rural north Georgia site. Desiring to have a limited impact on the landscape and be a self-sufficient building, the project sits lightly and responds formally and materially to environmental conditions. As an adjustable machine, the house operates to regulate use and performance.



Gordon County in Northwest Georgia



Dogtrot and shotgun

### MATERIAL PRECEDENT – VERNACULAR TYPOLOGY

Beginning with the typology of the dog trot house, the Low Country line house sets the central porch on an asymmetrical bi-furcating axis. The result is a severing of the house into two distinct formal and programmatic pieces zones by use and duration. The small component housing the guest quarters and office space while the large portion houses the remainder of the housing functions. The porch

extends past the two defining walls of the Low Country Line House to create a suspended table into the landscape. The removal of the inhabitant for the ground plane and the re-establishment of an artificial datum for occupation objectifies and formalizes movement from the house to the landscape. The connection is light but noticed.



### THEMATIC ANALYSIS: CAUSE AND EFFECT

In the Low Country Line House a combination of materials are chosen for their specific qualities and applications. Cast-in-place concrete is selected to provide a delicate cage frame lightly touching the site on a series of square pilotis. Steel is chosen for the efficiency of size, providing small members that simultaneously serve as the lattice framework for the structural cladding members and mechanical tracks for an operable skin of glass, wood, and perforated metal. Wood glue laminate beams serve as the upper ribs for the rain catching vessel roof are used for the variable profile flexibility and the visually organic quality. Operable wood panels cloak the exterior blending the house with the surrounding woods. Each material is selected for form, performance, a perceptual reference.

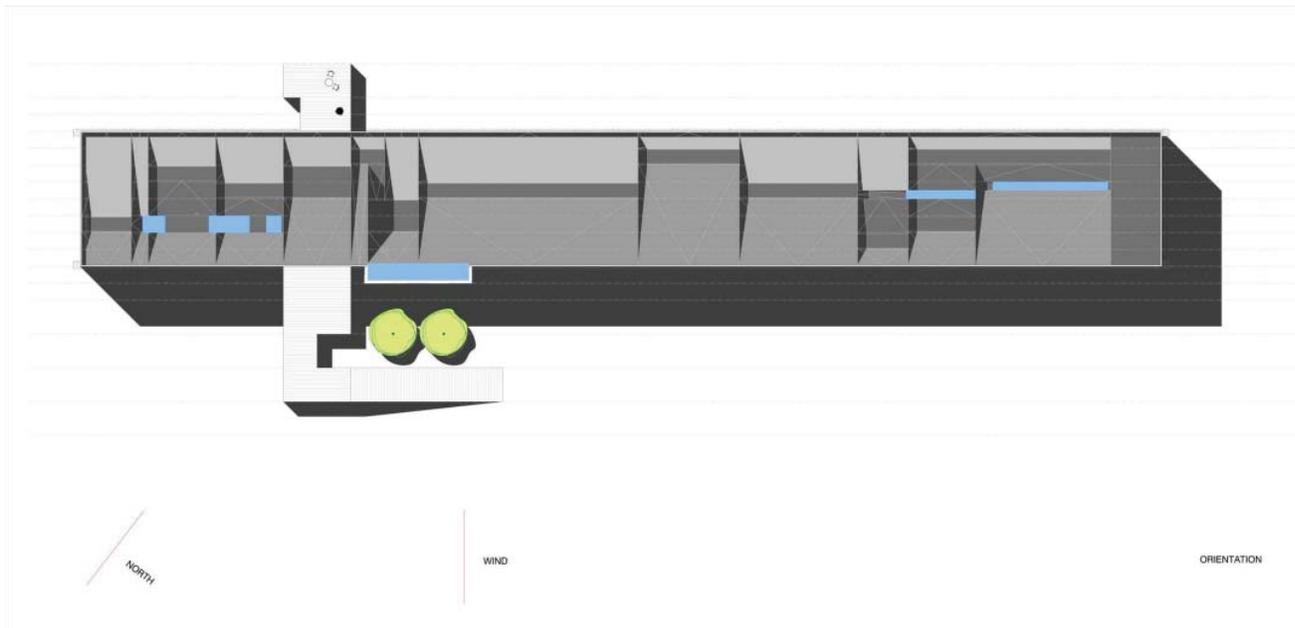
### MATERIAL, ECOLOGICAL, AND SUSTAINABLE IMPACT: CLIMATE / ORIENTATION / WIND / SUN / WATER / SITE

The Low Country Line house emerges out of trying to step lightly on the landscape. Catching rain-water for irrigation and grey water usage within the house, opening and closing to catch, funnel and harness prevailing winds, retract and expose surfaces to shield or gather sun, orienting itself toward micro and macro climatic conditions to optimize what is there, the house is a machine for the processes of providing lightly. Self sustaining due to philosophical as well as practical conditions, the remote condition of its location and associated siting sets the practicalities of the surrounding "natural" as the context for the house to respond to and collaborate with.

### TACTILITY + INTRINSIC NATURE OF MATERIAL

Material has tactility and an intrinsic nature. Its visual and emotional characteristics carry an interpretation. Its use, whether honest or applied, establishes an aura and a narrative. The aura comes from an emotive and experiential association whereas the narrative tells the story of its history, fabrication, and application.

The role between material and design has become disengaged. Historically there was a definitive relationship between material, place, and form. Technology (through both the diversity of materials currently available as well as the globalism of their availability) has divorced a material from form. Any structure can be associated with any shape and associated with any material. Such material application is evident throughout history, from Augustus' attitudes of structure to skin "I found Rome of clay; I leave it to you of marble!" to a more recent example of the Disney Concert Hall changing from stone to metal cladding without affecting the design or form whatsoever.<sup>2</sup> Such separation has removed material from the design process positioning it as a design finish. Material has lost its foundational premise turning it into a simulacrum. The foundational premise of the Low Country Line House is the expression of the material as collaboration between design and construction will result in Architecture.



### MATERIAL COMPONENTS/ MATERIAL APPLICATION

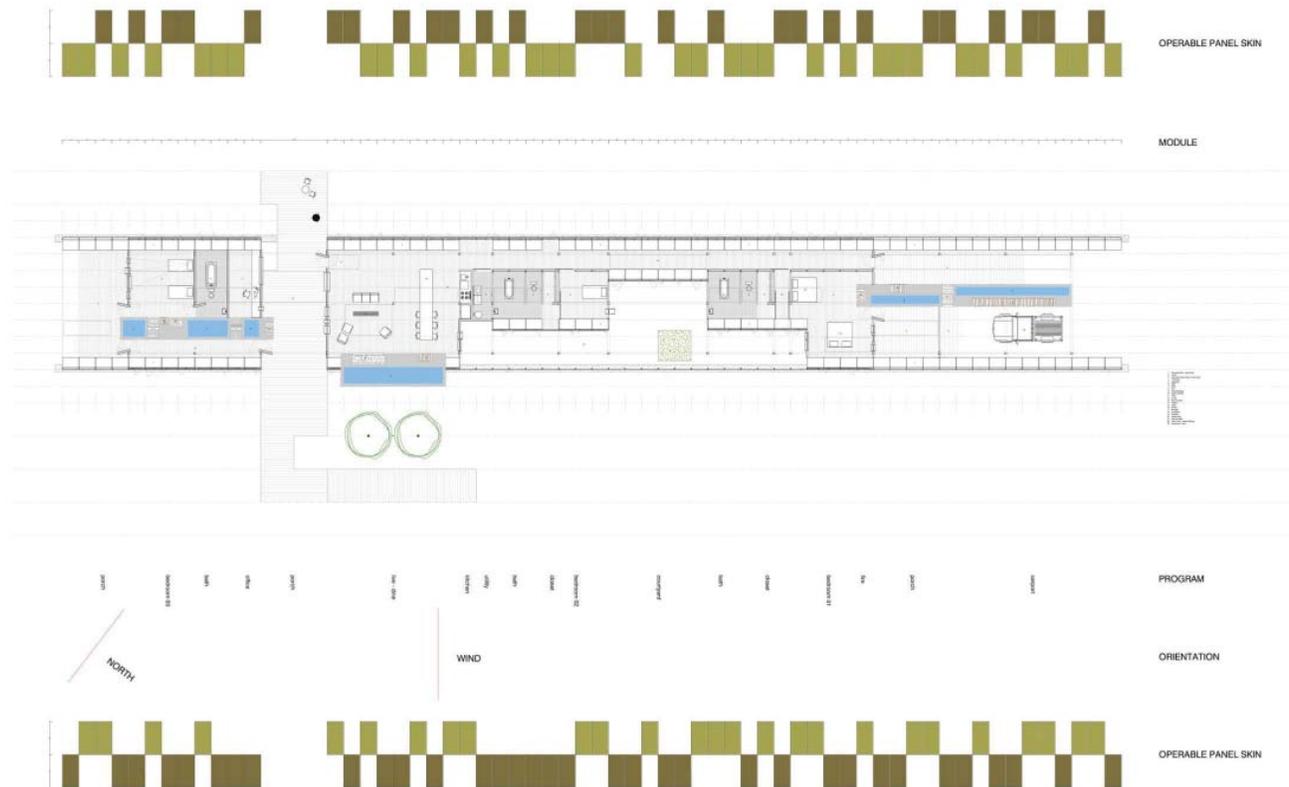
The Low Country Line House has three primary materials – one for skin, one for structure, and one for the roof. Each component adopts the appropriate material based upon its performative necessities. Each material establishes the associative form of each component emerging from the physical capabilities and limitations of the material while addressing the specific functional requirements of its usage.

The structure is a cast-in place reinforced concrete frame that sets the primary spatial and programmatic module of the house.

The skin is a series of layered surfaces, operable to allow the house to breathe and adapt. The exterior layer is a resin impregnated plywood skin. Floating off the surface of the building it serves as a curtain for privacy, as the outer shell to deflect solar radiation, as a sun control surface, as a valve for the wind funnel roof surface, and as the outer shell for the thermal mass of the wall. Beneath this plywood surface is a metal panel bifurcated in elevation into an upper operable casement window and a lower screened and louvered panel. An inner plywood surface folds up to cover the lower louvers. When down it is flush with the wall, when up it serves as a table/work surface

running the length of the house moving from indoors to outdoors.

The roof is formed by a series of glue laminated beams holding a thin shell shotcrete basin for rain-water catchment. The wood glue laminate beams of the rain catcher are each custom fabricated out of laminated pieces allowing for a variable section to the rain catcher based upon the program of the room below, the position of the roof vent and the quantity of airflow needing to be delivered. Varying in profile along the length of the house, the beams produce threshold profiles that the catchment basin morphs between from rib to rib. The variable profile allows for an expansion and contraction of the space between catchment basin and roof producing variable air flow intensities and roof vent positions directing air based upon the programmatic need and spatial organization below. Deeper beams allow for a tighter pinching of the airflow and thus an acceleration of available ventilation.

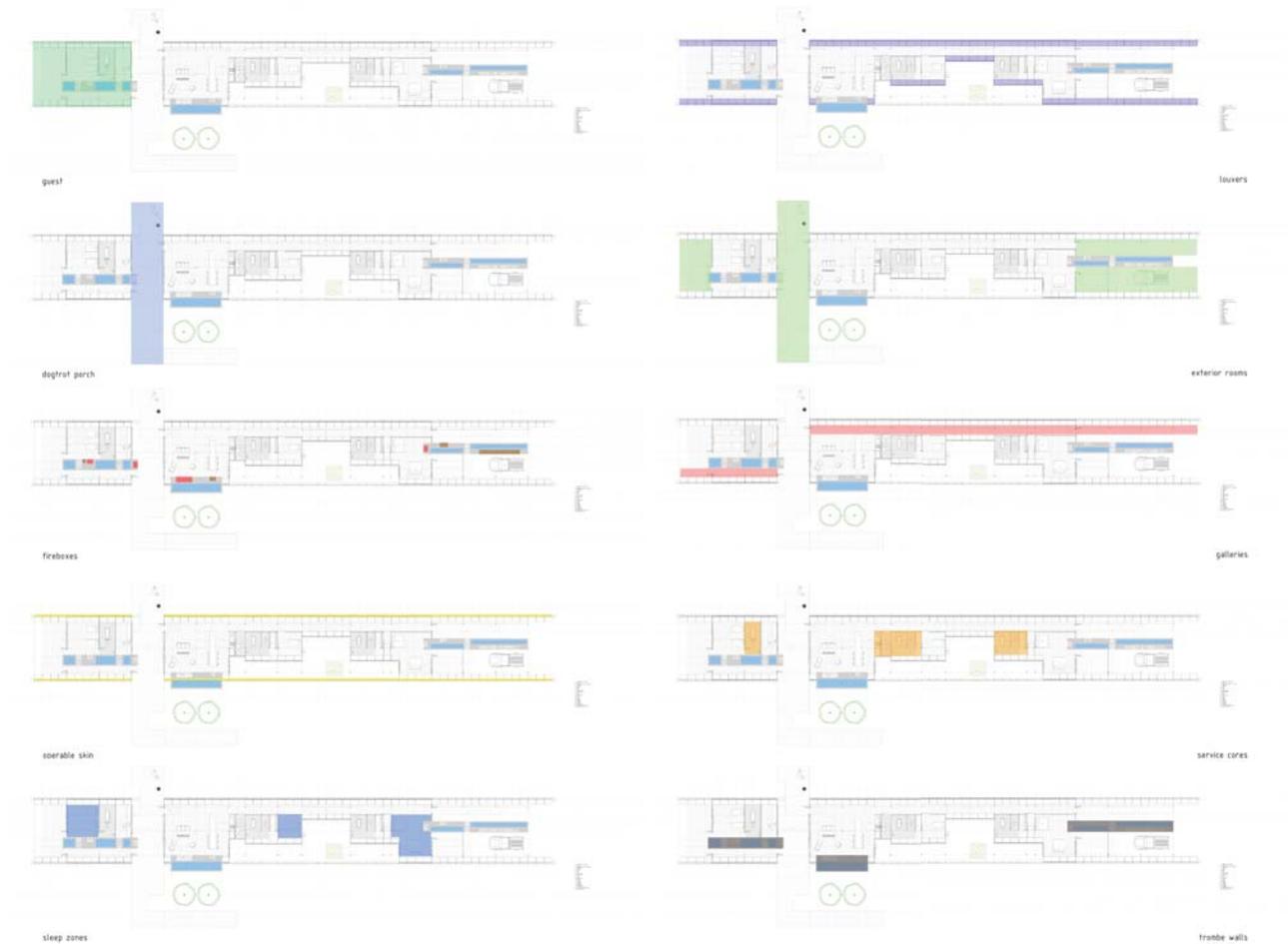


### MATERIAL PROGRAM – SPACE / USE / MATERIAL

The Low Country Line house is formally and programmatically compartmentalized within the two defining walls of the overarching form. Sectioned with every interior space having an associated exterior space, the boundary between out and in is constantly dissolved. The house contains two bedrooms each with a private bath. Each bedroom has positions for both summer and winter sleeping relative to the climatic and site conditions of the position and season. The main living space is consolidated into a single great room for living, dining, cooking that abuts the large central porch. Opposite this space is an office space buffering the guest quarters from the rest of the house. Organized primarily as a single loaded corridor that flips sides of the house at the dogtrot porch, the skein of the houses expands and contracts to respond to each of the adjacent spaces climatically and functionally to provide work and display surfaces.

### MATERIAL WEIGHT / FORCE LINES / STRUCTURAL LEGIBILITY / PERFORMANCE

In the Low Country Line House, the primary structure and weight is felt through the cage of the cast-in place concrete frame. Holding the floor plate and roof plate, the frame is articulated in a different material to express its individual nature from the other materials and components used in the house. The wall surfaces use the meter of the verticals as both structural tracks for the panels expressing the force and motion lines of the skin walls. The columnar grid carries through the structure expressed as pilotis feet [the only connection of the building to the ground other than the fireplace piers] and the extension fingers that touch the rain catcher. This structural frame is exposed through the house maintaining its prismatic character running consistently from inside to out along the length of the house.



## MATERIAL MODULE/DIMENSION

The Low Country Line House begins with the module of the material. The skin, based on a double stacked 4'x8' plywood module establishes the primary rhythm of the linear composition. Two bays high in section [with an additional one half bay module above grade] the dimension is established by the 8' vertical of a standard sheet of plywood. The house crests at 20' [4' - 8' - 8']. Longitudinally the bay system is established by the 4' module. Running as two parallel lines – these edges establish wall boundaries allowing the house to infill as needed between them. The ends are treated as exterior partition walls aligned with a bay seam allowing for the floor plate to continue from inside to out while still bounded laterally by the two primary wall lines. The alignment of the two facades is essential to allow for the effectiveness of cross-ventilation and exposure control.

The concrete frame picks up on the twenty four foot module of the skin wall establishing the exposed cage of the primary structure. Six bays wide and twenty four feet across the frame hold the floor plate and roof plate [from which the side walls cantilever] and picks up the primary beams for the rain catcher.



Aerial view showing roof rain catcher



Side view showing operable wall panels

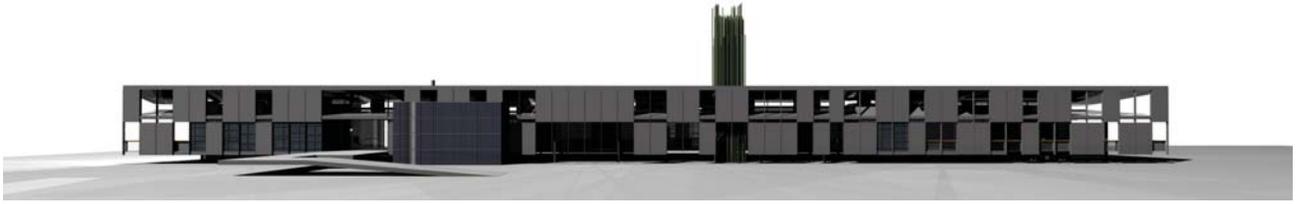


Open end porches

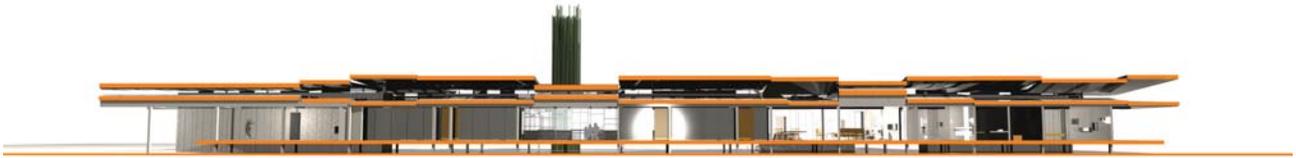


Side view showing upper wind funnel





Longitudinal Elevation



Section through program pavilions



Section through courtyard

### MATERIAL CORNER / EDGE / SURFACE

Throughout the history of architecture, the language, material and construction technique can be traced through the articulation of the corner. As a seam between materials and surfaces, it illustrates the way buildings, their forms and their materials come together. As the most significant connection, the corner is illustrative of an attitude towards surface, volume and mass. The Low Country Line House denies the corner by emphasizing the length of the linear surface. Focusing on a linear repetitive yet diversely operable surface, the house sets itself between the two lines of these primary parallel walls. Interior spaces and exterior rooms are generated between these walls. The turning of a space is disregarded for a more preferential interstitial bracketing.

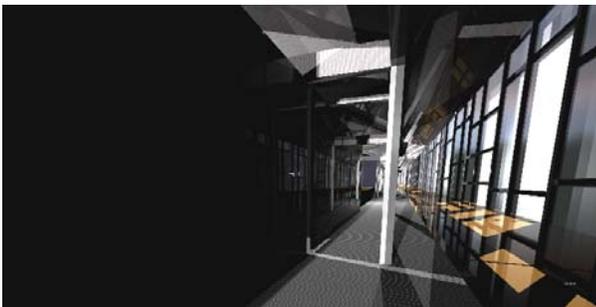
The role of the architecture then turns to the surface of enclosure – the two longitudinal operable walls aforementioned and the choreographed roofline, bending upward and downward between the two shells to vault the interior rooms, funnel wind, and collect water in the concave rain catcher. The connection of these elements comes through the space and the interaction of the user with these surface's diverse configurations.



Section through courtyard and hall



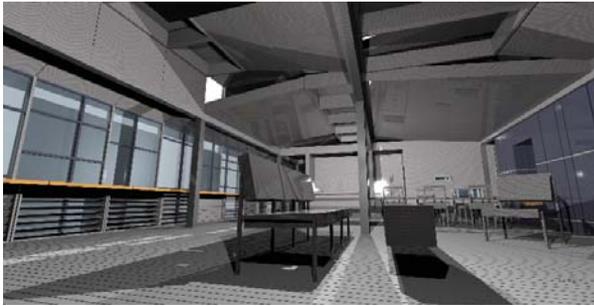
Section through dogtrot porch



Side hall – with operable surface [skin vs. structure] interior



[Skin vs. structure] interior



View of main living space with articulated roof and walls – operable and adjustable



View of dogtrot porch from outrigger deck

**MATERIAL EXPERIENCE – SPATIAL / LIGHT / VISUAL EFFECT**

The Low Country line is about the experience of place, the climate, the specifics of the natural surroundings, and their consistent relationship with the space and function of the interior rooms. The building, as a machine for viewing, engaging and collaborating with the environment, allows the inhabitant to operate its skin to create variable conditions. Light, view, programmatic need, and ventilation are all orchestrated through the physical and adaptable engagement with the building. Operable skins and roof vents allow for wall to become furniture and the skin to dissolve – expanding and contracting as necessary to respond to environment. The sequence of spaces center around a dog-trot porch that zones the house between guest and daily living and studded by large stone fireplace piers become anchored to the site through their extension beyond the walls and into the untouched surrounding landscape. The house through its abilities to moderate its environment is a collaboration and integration of site and architecture.

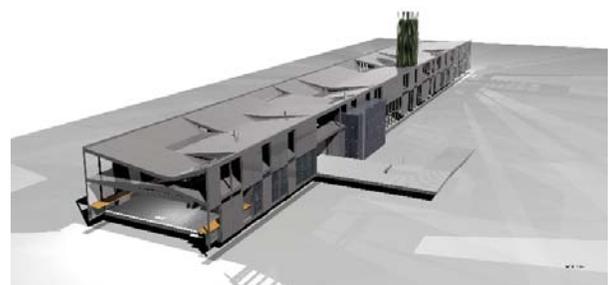


View from dogtrot porch along operable wall

**CONCLUSION**

This project emerges from a sensibility founded in material celebration. It works within the guidelines of a material’s performance, modularity, structural capabilities, formal presence and emotive power to produce an architecture that is of a material. As a case study it represents a material methodology founded in architecture of material influence.

1. Caesar Augustus from Cassius Dio 56.30.3 - At his death-bed
2. “However, construction of the concert hall itself stalled from 1994 to 1996 due to lack of fundraising. Additional funds were required since the construction cost of the final project far exceeded the original budget. Plans were revised, and in a cost saving move the originally designed stone exterior was replaced with a less costly metal skin. The needed fundraising restarted in earnest in 1996 - after the real estate depression passed - headed up by Eli Broad and then-mayor Richard Riordan and groundbreaking for the hall was held in December 1999.” Gehry, F. Symphony: Frank Gehry’s Walt Disney Concert Hall. Harry N. Abrams: 2003.



Helicopter view