ALGORHYTHMS™

MILGO
BUFKIN

General relativity predicts...gravitational waves, ripples in the curvature
of space that travel at the speed of light.
—Stephen Hawking

Dr. Haresh Lalvani standing with
manufactured columns.

Imagine

a new design vocabulary in which individual expression, creativity and taste are so closely accommodated that no two forms are the same. Just as our genetic code permits each of us to be unique, so too AlgoRhythm Technologies™ generates a wide range of unique forms from its genetic code.

AlgoRhythm Technologies offers a wide range of curvilinear structures with fluid movements mirroring the flows of nature. Material flows under its own weight and other forces according to morphologic laws that pertain more to fluid motion than to static objects. By freeing the elements of construction from their rigid geometries, AlgoRhythm Technologies unfolds infinite opportunities to model a new architecture. The undulating look of these structures results from the behavior of sheet metal under force. The forms are non-deformational, thereby maintaining the integrity of the metal.

Dr. Haresh Lalvani, architect-morphologist and inventor of these new forms, states:

> *AlgoRhythms proceed from the "bottom-up." Columns, walls and ceilings, the first series of products introduced here, are based on morphologically structured information (meta architecture) that permits endless variations on a theme. The term "AlgoRhythm" captures the flow, harmony and movement in the shape of the products as well as the use of generative procedures. This project has enabled me to experiment with the relationship between a genetic code and the manufacturing process.*

To create these structures, a procedure was developed so that single, continuous metal sheets are shaped by computer-driven equipment according to algorithmically generated geometries. This approach permits the structures to be modeled and easily fabricated translating into a reasonable cost.

AlgoRhythm Technologies produces patented structures with an elegant new look that also appear to be structurally advantageous. It is a vivid example of high technology bringing us closer to nature while offering a new curvilinear vocabulary previously unavailable to architects.
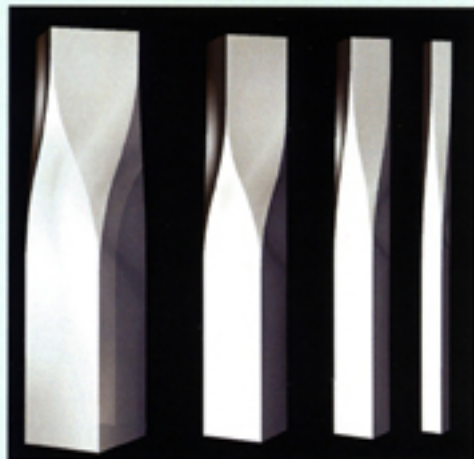
COLUMN COVERS

Note: Images with an asterisk before the number of the item are actual photographs of manufactured AlgoRhythms.
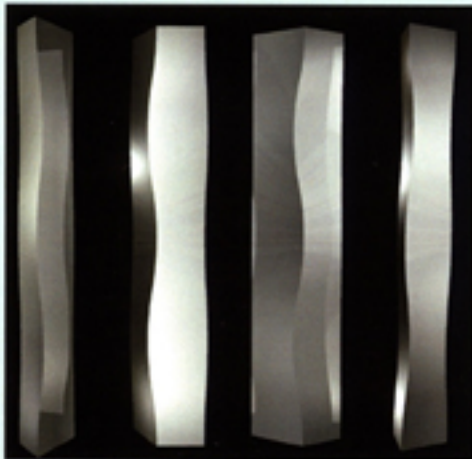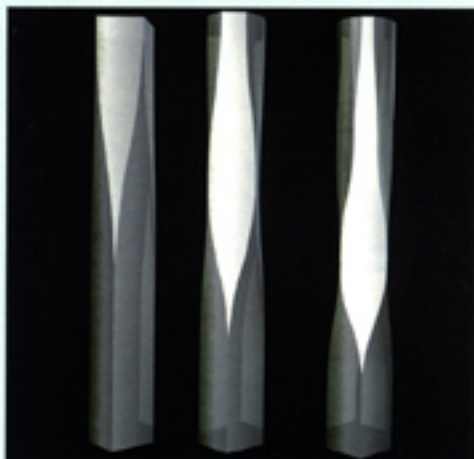
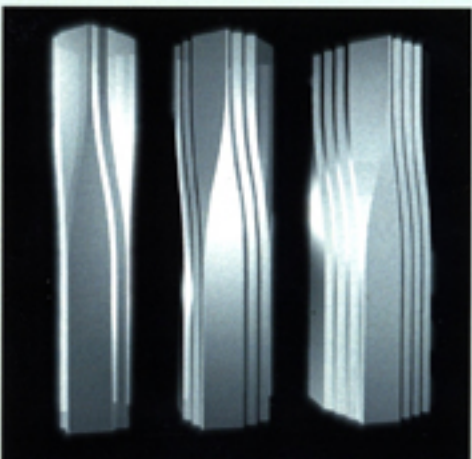Rhombic Wave Column Cover
ACC-10

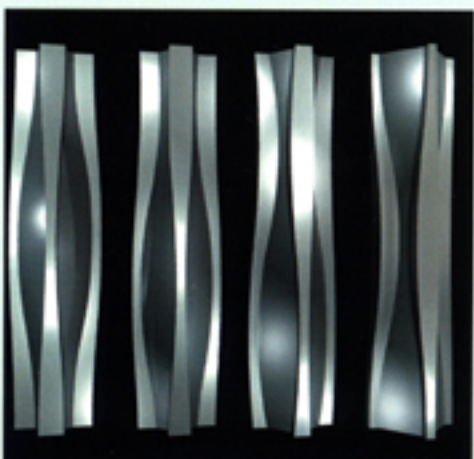Anti-Prism Wave Column Cover
ACC-20

Digon Wave Column Cover
ACC-30, 31, 32, 33

Branched Fractal Wave Column Cover
ACC-40, 41, 42

Fluted Anti-Prism Wave Column Cover
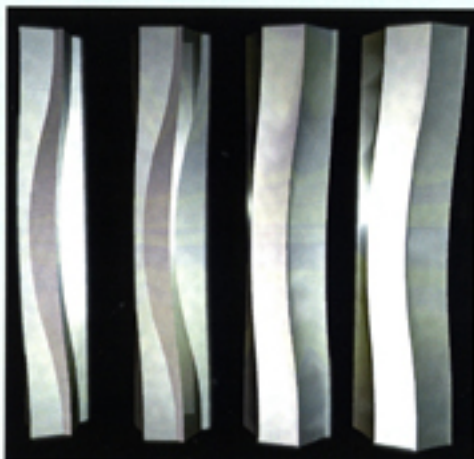ACC-50, 51, 52

Ribbed Wave Column Cover
ACC-60

ALGORHYTHM COLUMN COVERS

Description: AlgoRhythm Column Covers can be used for building exteriors and interior spaces including, but not limited to lobbies, conference rooms, showrooms, exhibitions, residences, hotels, airports, convention centers, retail stores, restaurants and malls. The distinctive forms of these column covers add a dynamic quality to any space.

Form: The wide choice of AlgoRhythm Column Covers and the variations within each type provide forms to suit a broad range of design needs.

Geometry: AlgoRhythm Column Covers have variable cross-sections with constant perimeters along their lengths. The angle of bend between any two faces in the cross-section is constant throughout.

Variations: The algorithmic approach to architecture and design permits a large number of variations in these products. While the column covers shown here are all vertical and have constant perimeters, tilted as well as tapered versions are also possible. In addition, the proportions, intensity of the curves and number of sides can be varied. The height and diameter can be chosen to meet design needs.

Sizes: Column covers can range in diameter from 6 inches and up. Column covers without horizontal seams can be made up to 20 feet in height. Column covers with horizontal seams can be made in any height.

Details: All AlgoRhythm Column Covers are pre-engineered for quick and easy installation in the field.
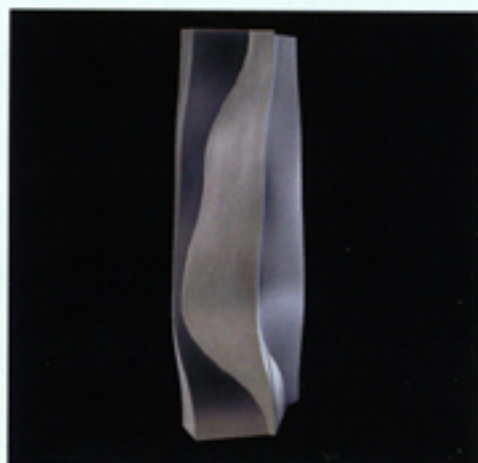
Compatibility: AlgoRhythm Column Covers work in conjunction with AlgoRhythm Ceiling and Wall Systems and also in conjunction with conventional systems.

Half-Wave Star Column Cover
ACC-70

Wave Star Column Cover
ACC-80, 81, 82, 83
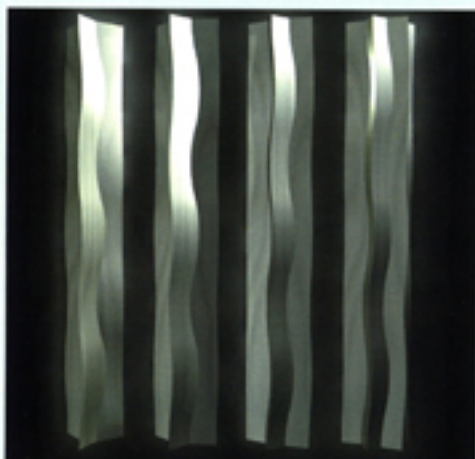
Multiple Wave Star Column Cover
ACC-90, 91, 92, 93

Fractal Wave Star Column Cover
*ACC-100

Irregular Wave Column Cover
*ACC-111

COLUMN COVERS

Stand before it and there is no beginning.
Follow it and there is no end.
—Lao Tsu

Half-Wave Star Column Cover
*ACC-70

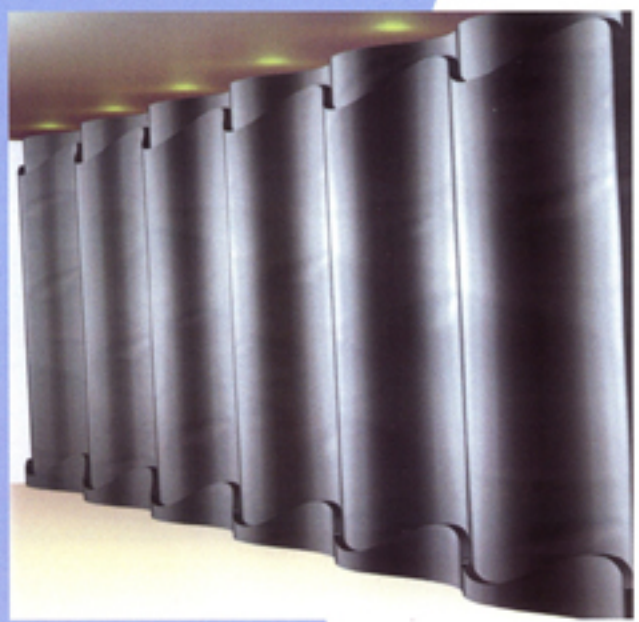*See how various the forms, and how unvarying the principles.*
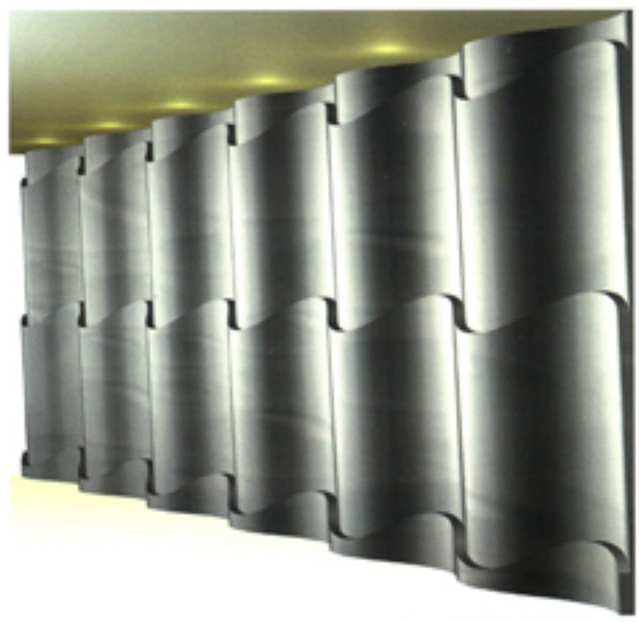—Owen Jones

Irregular Wave Column Cover
*ACC-111
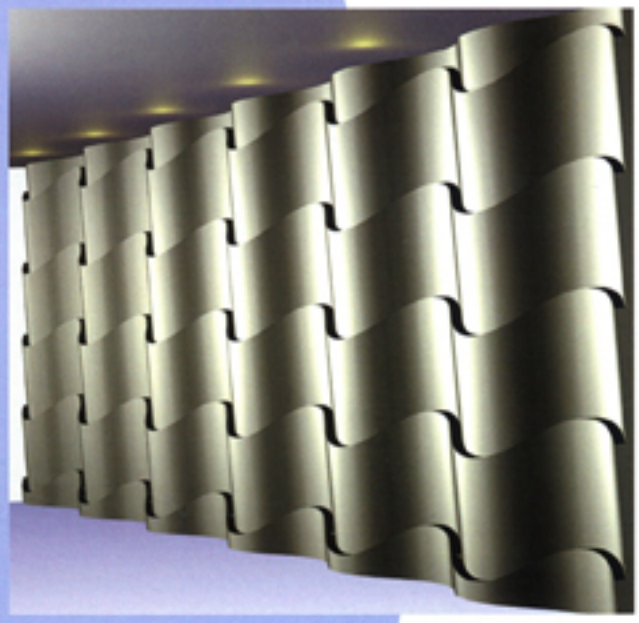
Fluted Anti-Prism Wave Column Cover
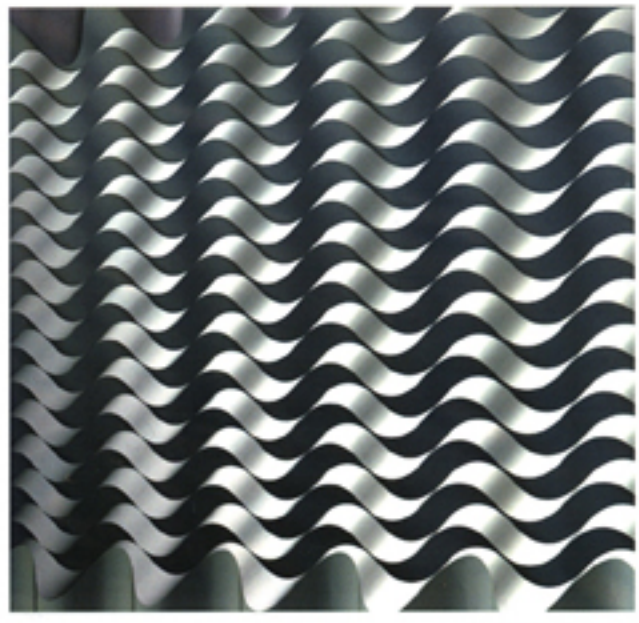*ACC-50

WALL SYSTEMS
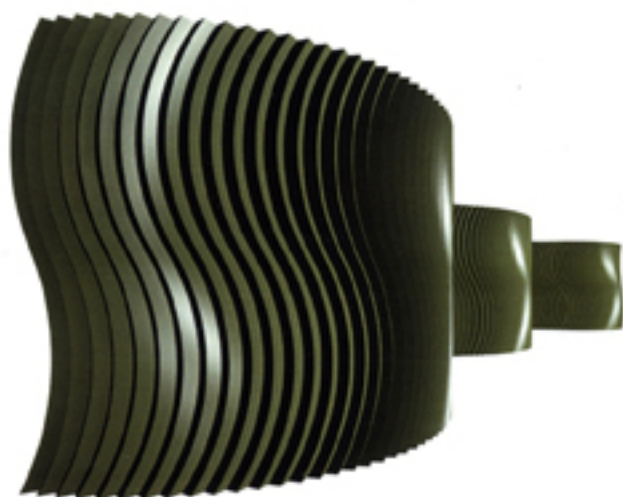

Cascade One Wall System
AWS-10

Cascade Two Wall System
AWS-20
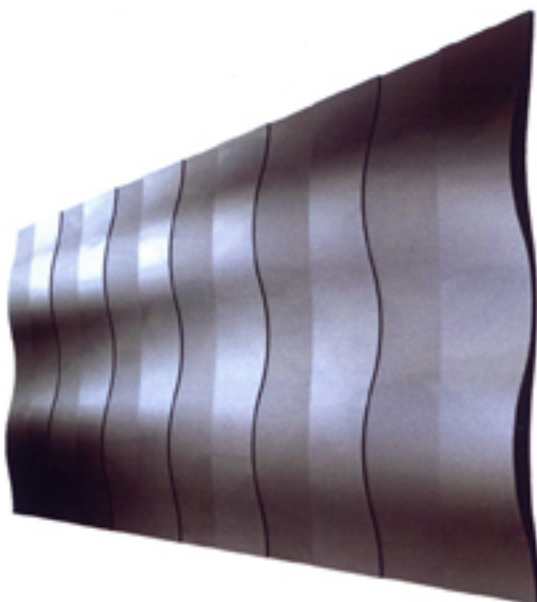

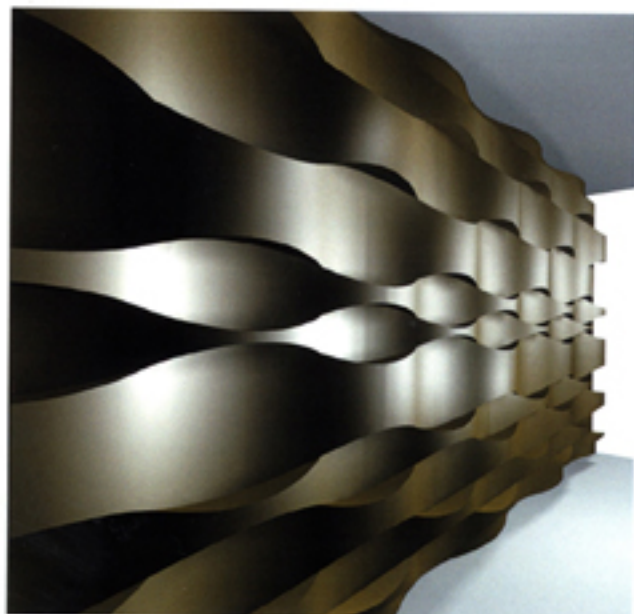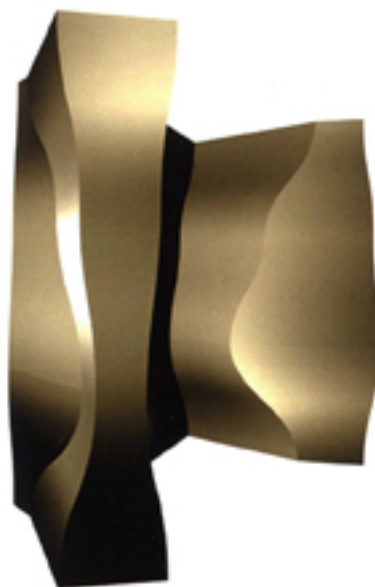Cascade Four Wall System
AWS-30

Ripples Wall System
AWS-40

Serpentine Wall System
AWS-50

Undulation Wall System
AWS-60

Nested Undulation Wall System
AWS-70

Irregular Undulation Wall System
AWS-80

ALGORHYTHM WALL SYSTEMS

Description: AlgoRhythm Wall Systems can be used on building exteriors and in interior spaces including lobbies, conference rooms, showrooms, exhibitions, residences, hotels, airports, convention centers, retail stores, restaurants and malls. Used in large public spaces, these forms can direct the movement of the eye and the flow of traffic.

Form: The curvilinear forms can be varied in size and curvature depending on design needs. The undulations can be in any direction (vertical, horizontal, inclined) or in any plane. Planes can be flat or curved.

Modules: All walls are constructed from 3-dimensional modules of variable size up to 4 feet-6 inches by 11 feet.

Details: All modules are attached to each other and to a supporting wall or structural framework by joining details.

Compatibility: AlgoRhythm Wall Systems can work in conjunction with AlgoRhythm Ceiling Systems and Column Covers and in conjunction with conventional systems.
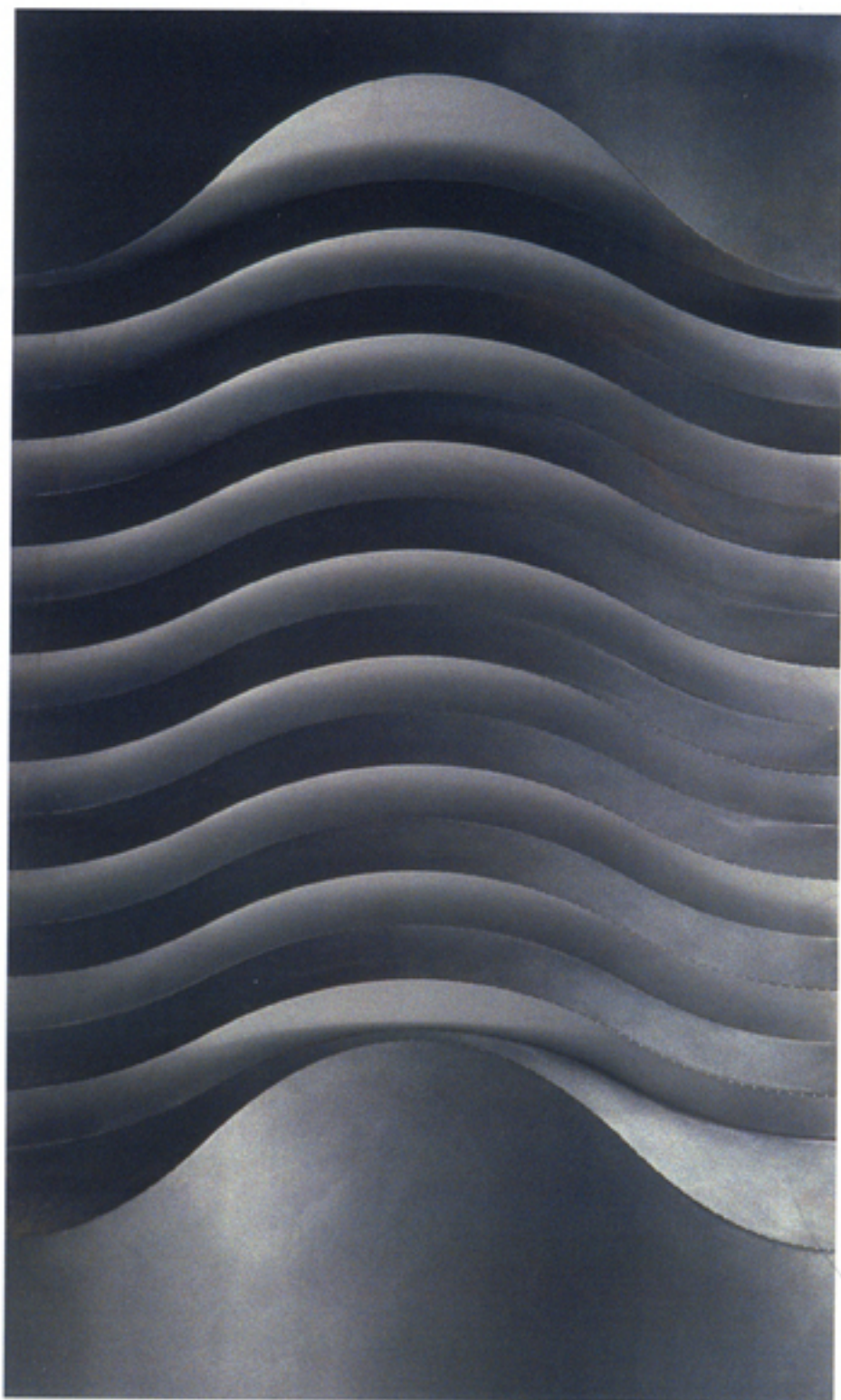
WALL SYSTEMS

The dilemma posed to all scientific explanation is this: magic as geometry."
—René Thom

Cascade Four Wall System
*AWS-30

A more important set of instruction books will never be found by human beings.
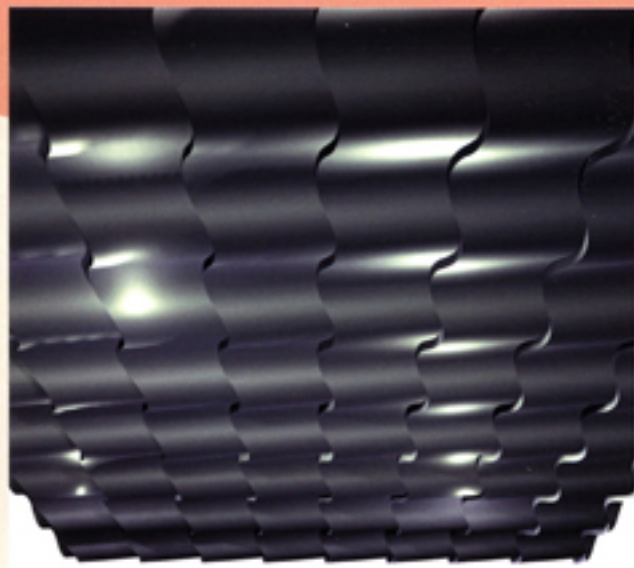—James Watson, on the Human Genome

Ripples Wall System
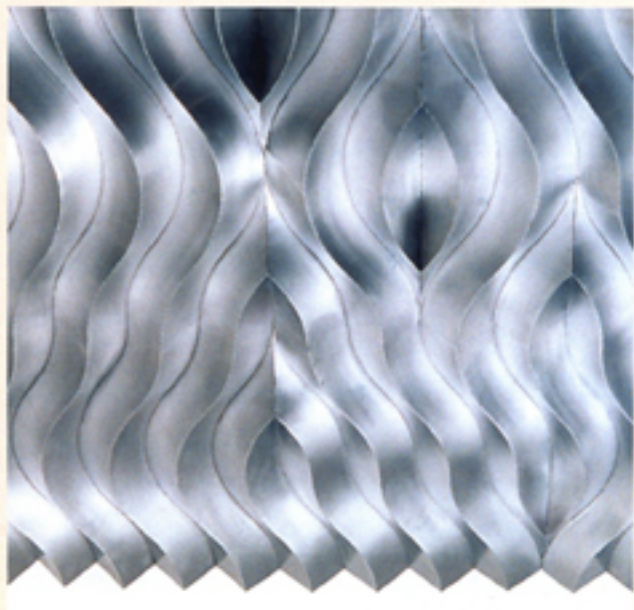*AWS-41

CEILING SYSTEMS

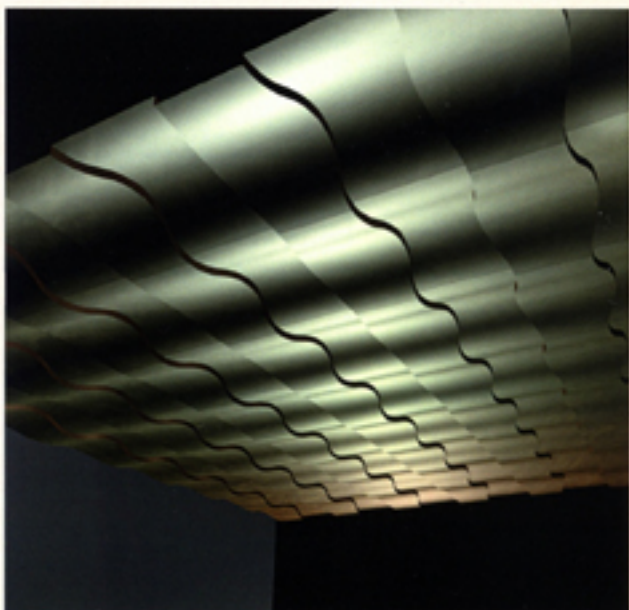Note: Images with an asterisk before the number of the item are actual photographs of manufactured AlgoRhythms.

Cascade Ceiling System
ACS-10

Ripples Ceiling System
*ACS-20

InterRipples Ceiling System
*ACS-30

Undulation Ceiling System
ACS-40

ALGORHYTHM CEILING SYSTEMS

Description: AlgoRhythm Ceiling Systems can be used in exterior applications such as canopies and arcades. The interior applications are almost limitless and include lobbies, elevator interiors, conference rooms, offices, showrooms, exhibitions, residences, hotels, airports, convention centers, retail stores, restaurants and malls.

Form: The curvilinear forms can be varied in their size and curvature depending on design needs. The undulations can be in any direction on a flat, curved or irregular plane.

Modules: All ceilings are constructed from 3-dimensional modules of variable size up to 3 feet-6 inches by 8 feet. However, panels are typically smaller in keeping with conventional ceiling systems.

Details and Suspension Systems:
AlgoRhythm Ceiling Systems are highly distinctive in appearance, but conventional in functionality and installation. As with conventional systems, a black-iron grid is applied to the raw structures, a suspension system is attached to the grid, and individual panels are supported by the suspension system. The suspension system can be visible or hidden. Custom installation systems are available to suit special design needs.

Compatibility: AlgoRhythm Ceiling Systems can work in conjunction with AlgoRhythm Wall Systems and Column Covers and in conjunction with conventional systems.
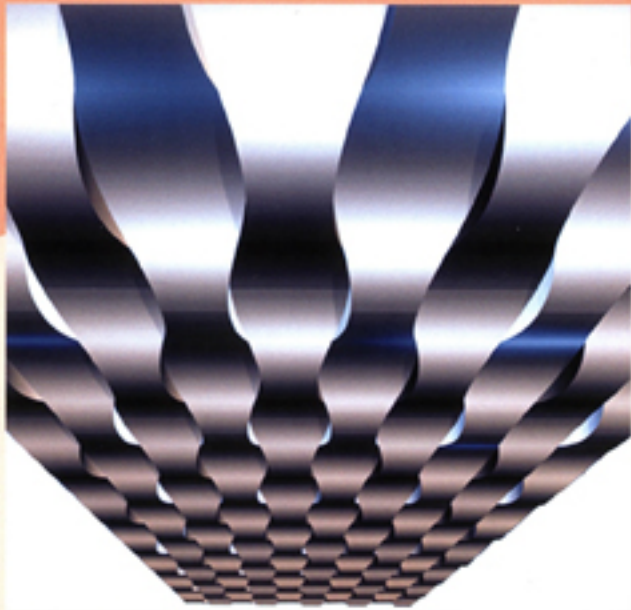
Nested Undulation Ceiling System
ACS-50
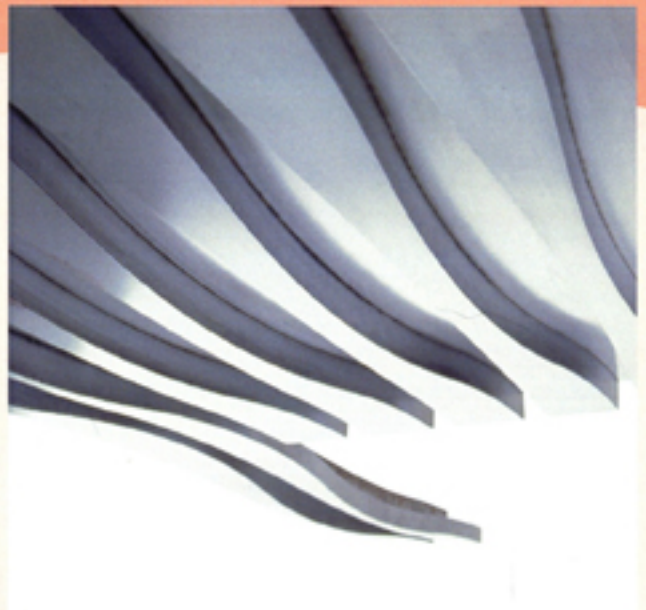
Box Ripples Ceiling System
*ACS-60

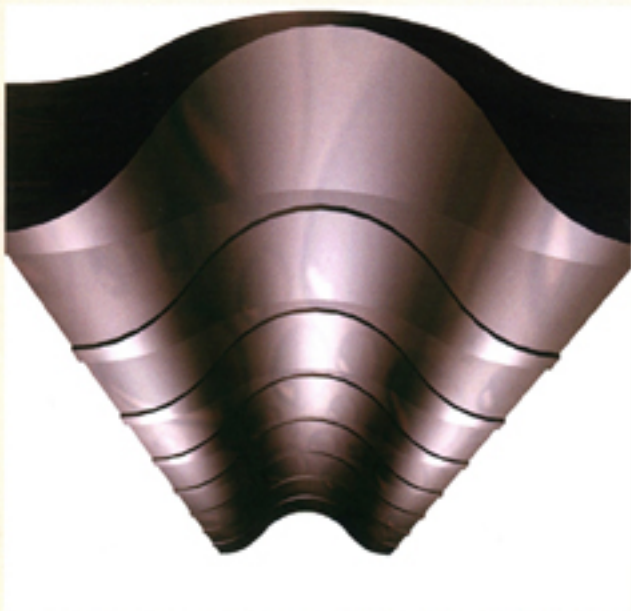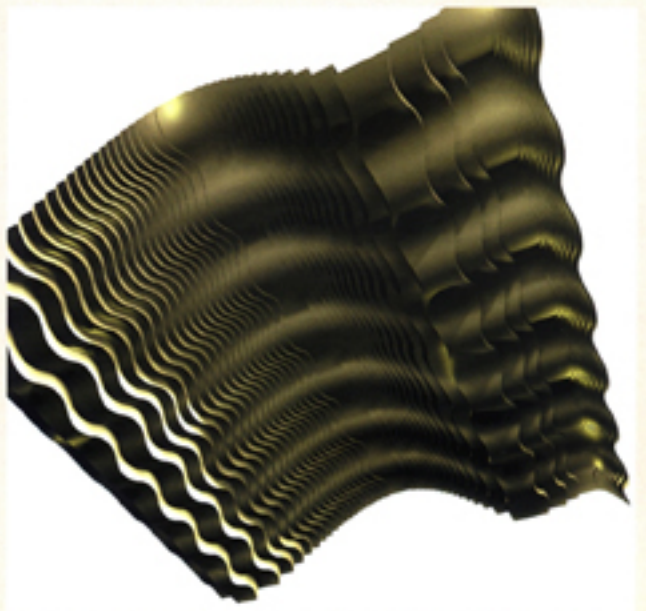Vaulted Wave Ceiling System
ACS-70

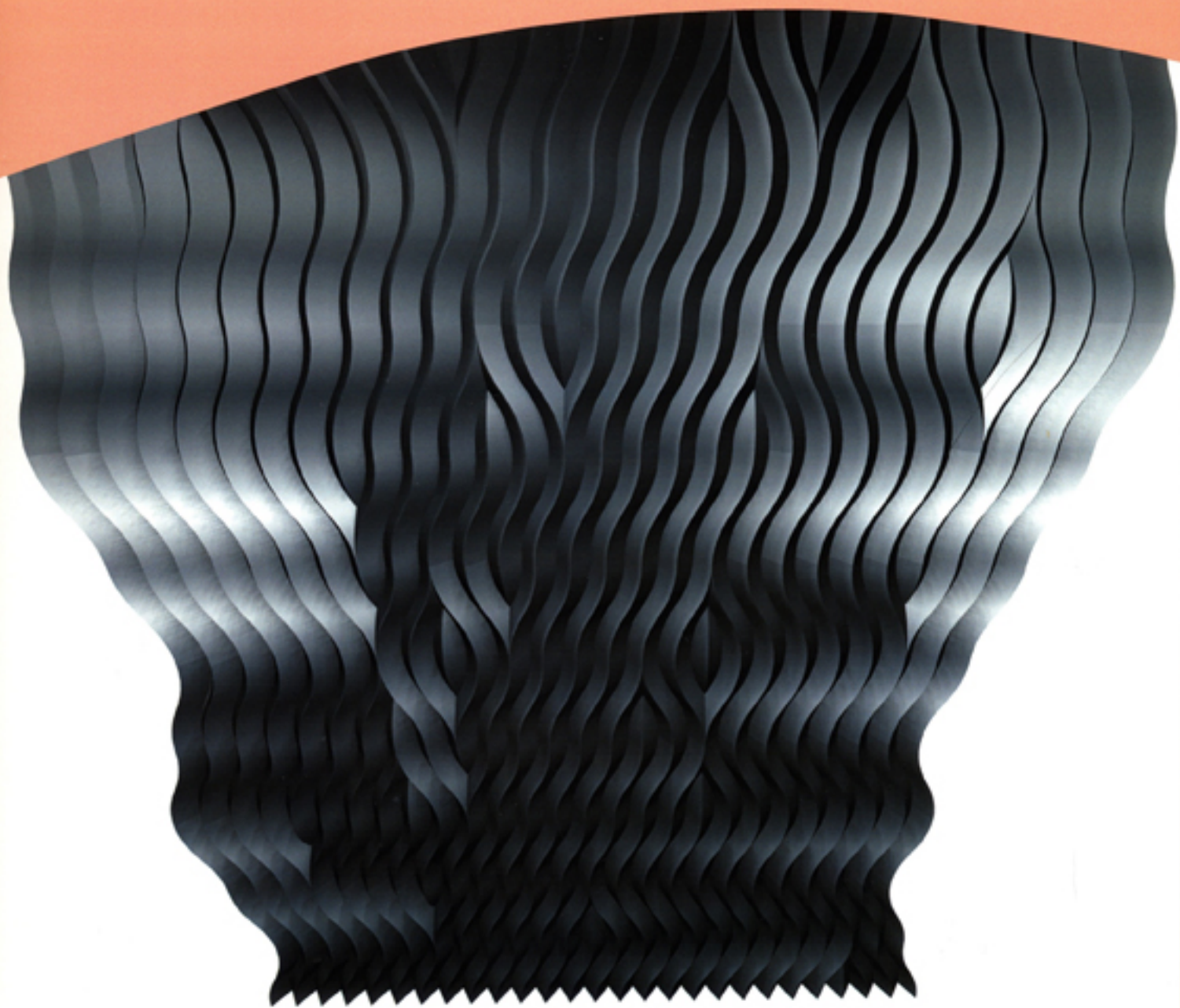
Cascaded Wave Ceiling System
ACS-80

CEILING SYSTEMS

Our architecture rolls, swims, flies.
—El Lissitzky

Box Ripples Ceiling System
*ACS-60

...every fold originates from a fold.
—Gilles Deleuze

InterRipples Ceiling System
ACS-31

HISTORY

Bruce Gitlin, owner and CEO of MILGO/BUFKIN, long desired to create origami in metal. If a delicate bird could be created from a sheet of paper, he wondered if a sheet of metal could be similarly folded to yield elegant new forms.

Gitlin's grandfather started MILGO/BUFKIN in 1916 as a truck body shop, and his father expanded the company to bend metal for architectural applications. Gitlin discontinued the truck work, added the fabrication of sculpture, purchased state-of-the-art equipment, and developed new technologies, growing the company exponentially. For the past thirty years, MILGO/BUFKIN has continually introduced new materials, finishes, and technologies to support the innovations of leading architects, designers and artists.

When Gitlin was searching for new approaches that would transform architecture in the new millennium, he met Dr. Haresh Lalvani, a prominent architect-morphologist, known for his use of higher dimensional mathematics to create structures based on new geometries. Dr. Lalvani has been a professor for the past thirty years at Pratt Institute, the New York based, internationally acclaimed school of art, architecture and design.

Their serendipitous meeting began a collaboration that enabled Dr. Lalvani to combine decades of research and many patented inventions with MILGO/BUFKIN's cutting-edge fabrication technologies. Their collaboration over four years of research and the filing of several patents led to AlgoRhythm Technologies, a division of MILGO/BUFKIN dedicated to the design, production, and marketing of a unique line of architectural products with curvilinear surfaces.

The transformation of AlgoRhythm Technologies' designs into products was facilitated by the metal working expertise of Alex Kveton, a sculptor with a fine arts and industrial design background. Also key to the effort was the computer modeling of Neil Katz, a former student of Lalvani's and now an associate at Skidmore, Owings & Merrill. Katz used advanced software to translate Dr. Lalvani's algorithmic concepts into computer models used to manufacture the products and to generate some of the images used in this brochure. The images were then computer-rendered by Mohamad Al-Khayer and Ajmal Aqtash, former and current students respectively.

Dr. Lalvani's new architectural forms can transform the design field, for they facilitate the creation of endless variations of integrated design environments with innovative, curvilinear surfaces. Bruce Gitlin and Dr. Haresh Lalvani have created a new architectural language grounded in nature and higher mathematics. They have gone far beyond their initial search for origami in metal.

HARESH LALVANI, Ph.D.

AlgoRhythm Technologies is the culmination of Dr. Haresh Lalvani's career in combining architecture and higher mathematics to create a new architectural vocabulary of surfaces, especially in metal. A professor at Pratt Institute for the past thirty years where he has influenced generations of designers and architects, Dr. Lalvani holds a Ph.D. in Architecture from the University of Pennsylvania. Known worldwide for his morphological, structural, and design innovations, he serves on the editorial boards of *Space Structures*, (U.K.), and *Structural Topology* (Canada). He is also affiliated with The Structural Morphology Group (European-based), the International Association of Shell and Space Structures, the Japan Institute of Hyperspace Science, and ISIS-Symmetry (Hungary).

An award recipient from the Graham Foundation for Advanced Studies in Fine Arts, the National Endowment for the Arts, and the National Institute for Architectural Education, Dr. Lalvani continues his groundbreaking work as an artist-in-residence at the Cathedral of St. John the Divine in New York and as the Co-Director of the Center for Experimental Structures at the School of Architecture, Pratt Institute. He is a MILGO/BUFKIN Design Fellow.

Dr. Lalvani holds numerous patents that combine morphology, mathematics, and design. From his playful and challenging Metapuzzles to his discovery of Hyper-Geodesic Structures for architecture, he has combined his love of both art and mathematics to generate new languages of design.

BRUCE GITLIN, CEO, MILGO/BUFKIN

Bruce Gitlin is the third generation of his family to head MILGO/BUFKIN. He joined the company after receiving a Bachelor of Science in Metallurgical Engineering in 1963 from Lehigh University. Since then, he has built MILGO/BUFKIN into an innovative, world-class metal fabrication facility incorporating the latest technologies while maintaining its tradition of old-world craftsmanship.
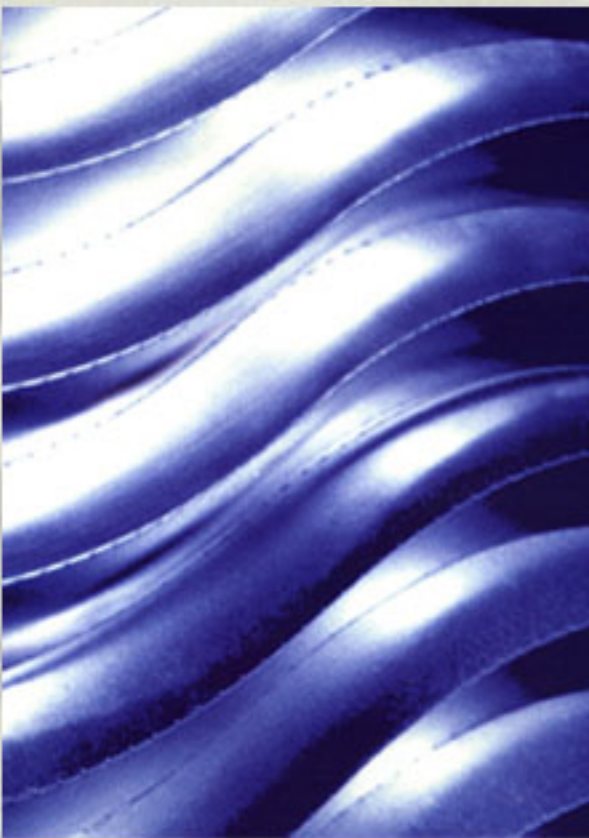

MILGO/BUFKIN

Located in Brooklyn, New York, MILGO/BUFKIN has more than eighty years of experience in fine metal work, contributing to the buildings that continually transform the skyline of New York and cities throughout the country and around the world.

MILGO/BUFKIN is one of the foremost fabricators of custom architectural metal, combining state-of-the-art technology and old-world craftsmanship to transform stainless steel, steel, aluminum, bronze, titanium and other metals in a variety of finishes into objects of beauty and utility.

MILGO/BUFKIN manufactures to customer specifications, using the most sophisticated CAD software. Giant press brakes, metal shears, laser and waterjet cutters, punches, and precision welding equipment create everything in metal: from massive curtain wall components, to decorative metal for lobbies, to fine sculpture.

MILGO/BUFKIN works with architects, designers, contractors, artists and building owners to bring in projects on-time, within budget, and to exact specifications, accommodating orders for both individual prototypes and large production runs.

SHAPING SPACE

The vocabulary of AlgoRhythm elements that includes columns, walls, and ceilings can be extended to shape architectural space for various functions, in combination with each other or with conventional building components. AlgoRhythm Technologies offers unlimited opportunities to architects and designers.

Umbrellas

Transitions

Wavestrut System

Column Museum
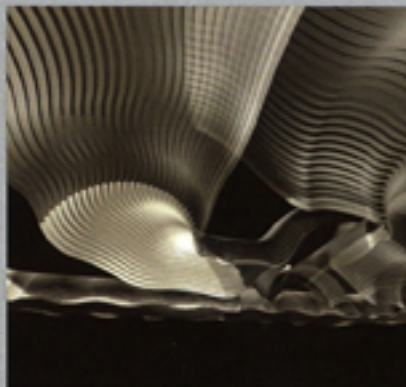
Waveknot

Wavespace Labyrinth

ALGORHYTHM PRODUCTS

MATERIALS AND FINISHES

STEEL
Finishes include factory primed for your finish at the site, paint, and state-of-the-art finishes.

STAINLESS STEEL
Finishes include mirror and satin polished, sandblasted, photo etched, and various proprietary finishes.

BRONZE
Finishes include raw bronze, patina, and mirror and satin polished with clear coating.

ALUMINUM
Finishes include raw aluminum, paint, and clear coating.

PERFORATED METALS
All products are available in a variety of perforated metals with various finishes.

COMPOSITES
Finishes include factory primed for your finish at the site, paint, and state-of-the-art finishes.

SPECIFICATIONS
Contact MILGO/BUFKIN for specifications and further information.

MILGO/BUFKIN
AlgoRhythm Technologies™

Irregular Undulating Wall System
*AWS-81

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