

A R C H I T E C T U R E

SECTION

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Représentants:
Jean Balcer
Monique Michaud

Toronto
Griffin Group Inc.
4800 Dundas St. West, Suite 202
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Representative:
Mike Griffin

Bienfaiteurs/Patrons:

Ruth Cawker
Klaus and Marjut Dunker
Dan Hanganu
Michel Yergeau

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We apologize to the architects Curtis & Rasmussen from Cuyahoga Falls, Ohio, for not mentioning their names in connection with the Quaker Square Hilton (Vol. 1, No. 3). Curtis & Rasmussen were the designers of the project.

En page couverture, l'Usine de pompage de la ville de Longueuil, Québec, Boudrias, Boudreau, St-Jean architectes. Photographie de Karl Traut.

SECTION

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Rédactrice en chef/
Editor: Odile Hénault
Conception graphique/
Graphic Design:
Gilles Brouil
Montage/
Paste-up:
Jacques Bélair
Typographes/
Typographers:
Compotronic Inc.
Imprimeur/
Printer:
Pierre DesMarais Inc.
Photographie/
Photography:
Fish & Godin
Retouche/
Airbrush:
Nick Miscione

**Collaborateurs/
Contributors:**

Joost Bakker
Paul Boudreau
Maggy Cohen
Luis Conceicao
François Dallegret
Brian Fawcett
Susan Ford
Gilles Gheerbrant
Andrew Gruff
David Hastings
Ron Keenberg
Bertrand Lemoine
Detlef Mertins
Lorna McNeur
David Sissam
Alvaro Siza
Karl Traut

EDITORIAL

Le cap des trois premières livraisons de Section 2 est maintenant passé. Nous entrons dans une nouvelle phase, sur le plan du contenu, plus contemporain, et sur le plan de la diffusion, puisque notre public s'étend désormais à la grandeur du pays. Cependant, comme toute entreprise culturelle au Canada, nous souffrons de l'immensité du territoire et de l'éparpillement de nos lecteurs.

Textes, projets et fonds: voilà en quoi consistent nos besoins. Textes et projets, non que nous soyons à court de matériel, mais parce que nous aimerions avoir la possibilité de choisir. Cette situation est particulièrement cruciale pour ce qui est du matériel de langue française. À croire que le discours architectural est inexistant au Québec. Pour ce qui est des fonds, nous souffrons des mêmes problèmes que toute publication préoccupée de valeurs autres que purement commerciales ou prestigieuses.

Nous inaugurons ce premier volet de projets contemporains par une série de travaux reliés à un type d'architecture longtemps négligé, mais qui commence enfin à prendre sa place légitime: l'architecture industrielle. Qu'il s'agisse de structures existantes remises à neuf ou de bâtiments récents, les six projets inclus dans la présente livraison de Section 2 reflètent un intérêt nouveau pour une dimension plus modeste de l'architecture, laquelle marquera peut-être les années 80, tout comme les méga-projets ont caractérisé les années 60 et 70.

L'un des projets présentés, la Station de pompage d'eau brute de Boudrias, Boudreau, St-Jean, s'est mérité l'une des médailles du gouverneur général pour l'année 1983. Les projets des compagnies Facelle et Kinetics avaient également été soumis au jury, mais ni l'un ni l'autre n'a été primé. Par contre, le Musée d'anthropologie d'Arthur Erickson, terminé en 1976, a reçu une médaille.

Sans vouloir remettre en question la décision du jury, nous comprenons difficilement comment, même s'ils sont présentés dans des catégories différentes, des projets datant d'une époque où les budgets ne constituaient pas un facteur primordial puissent être mis en lice avec des projets récents d'origine beaucoup plus modeste. À notre avis, l'Institut royal d'architecture du Canada, et tout organisme à la source de prix d'excellence en architecture, devrait encourager la qualité du design même lorsque les budgets sont limités et que la nature des bâtiments ne se prête pas nécessairement à des fonctions de prestige.

With the fourth issue of Section 2, we are entering a new phase, both in terms of content, which will stress more and more contemporary work, and in terms of readership, since we now have subscribers throughout the country. However, as is the case with all cultural enterprises in Canada, the immensity of the territory to be covered, together with the dispersal and relative isolation of the audience, constitute major obstacles.

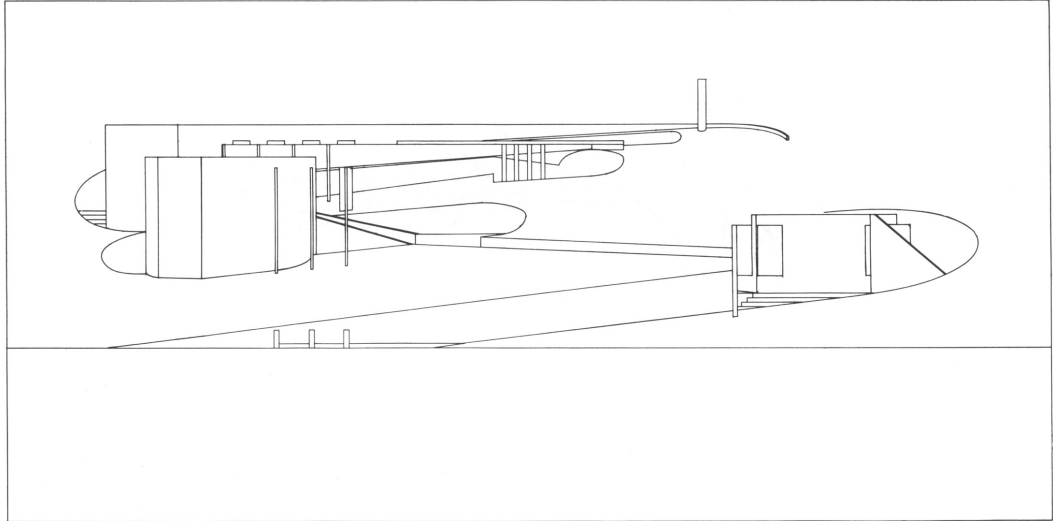
Texts, projects and funds: these are our needs. Texts and projects, not because we are short of material, but because we would rather have greater choice. This is particularly crucial at the present time with material to be published in French. One might be tempted to believe that there was no architectural discourse in Québec. As far as funds are concerned, our needs are similar to those of publications preoccupied with values other than the purely commercial or prestigious.

We inaugurate this series of contemporary projects with a type of architecture long neglected, but which is finally getting proper recognition: industrial architecture. Whether recycled existing structures or recent buildings, the six projects shown here reflect a new interest in an architecture of more modest proportions, a trend which may characterize the eighties as mega-projects did the sixties and seventies.

The "Station de pompage d'eau brute" by Boudrias, Boudreau, St-Jean, in Longueuil, was granted one of the 1983 Governor General's Medals for Architecture. The Facelle Co. Ltd. and the Kinetics Furniture buildings were also submitted to the jury, but neither one was selected. On the other hand, Arthur Erickson's Museum of Anthropology, finished in 1976, did receive one of the awards.

Without wanting to question the jury's wisdom, we find it difficult to understand how projects dating to an era when budgets were not an issue, could be considered along with new projects of a much more modest origin, even if they are judged in different categories. To our mind, the Royal Architectural Institute of Canada, and for that matter, any body granting architectural awards, should encourage design quality even when budgets are limited and the buildings are not necessarily of a prestigious nature.

Odile Hénault



Lorna NcNeur

Dominic Yap-Sam, Project Seven, Home for a Family of Five Musical Instruments

THE NINE SQUARE GRID

I was first introduced to the nine square grid by John Hedjuk, in 1976, during my first year at Cooper Union, School of Architecture. As a student of John Hedjuk's, I have found him to be a man whose presence inspires a highly creative search and demands that it be given form, respectful of the integrity of the thought from which it was born. His belief that learning occurs through osmosis forced us to question, search, and explore in countless directions to discover the answers that lay hidden in this mysterious object, called the nine square grid. Towards the end of that first year, I had decided that the definition of the nine square grid was: a discovery of the simplicity of the singular elements that make up the mysterious fabric of architecture. It was a year of passionate dedication and creativity, and the work that was produced by the class, that year, still remains poignantly inspirational in my mind. At the end of the year, I realized that the process of discovery had only just begun.

Description

The nine square grid is a tool with which to introduce first year students to the fundamental design principles of architecture. It is a biaxially symmetrical, rational structure which has the potential for inspiring highly creative and exquisitely masterful designs. Various interpretations of it have been taught at schools within the United States as well as just recently in Canada. However, few people recognize the nine square grid as a reductionist structure, and they therefore often fail to understand the potential of it as a classic design tool.

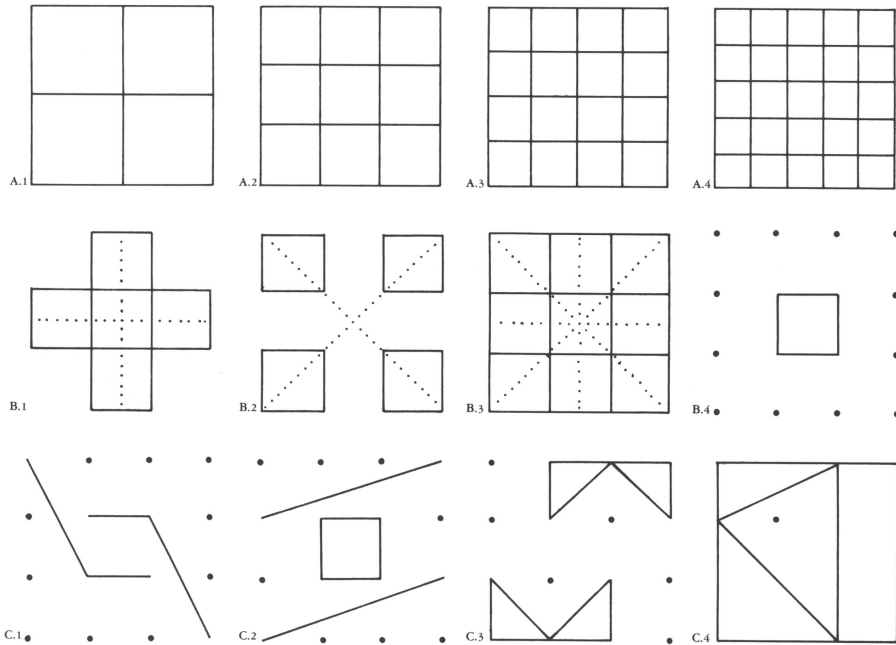
The first year of an architectural education should focus on the introduction of the fundamental concepts, orders and elements of architecture. Architectonics is the examination of the singular concepts, orders and elements of architecture. Its intentions are to encourage a student to arrive at a clear and thorough understanding of the singular events which comprise the highly complex organism of architecture.

The nine square grid is an abstraction of architecture. Abstraction is the identification of those structures present in any condition which are essential to its existence. Abstraction is the essence of reality. To extract the essence of many styles of architecture, by identifying those structures which are common to all of them, is to abstract architecture. The nine square grid is a physical manifestation of those structures present in architecture which are essential to its existence. The nine square grid is a tool designed to set forth the various architectonic issues: its inherent structure embodies the fundamental concepts, orders and elements of architecture.

The nine square grid is the only grid that contains a central space. (A.2) The four square grid contains a vertex at its center. (A.1) The sixteen square grid contains four squares and a vertex at its center. (A.3) The twenty-five square grid contains a central bay with two peripheral bays on either side of it. (A.4)

When working in the abstract, there is no particular reason for determining a limit of two, three, four, five or more peripheral bays. The nine square grid seeks to determine the limit by describing its essential condition. One central space with one peripheral bay on either side of it describes the essence of core/periphery irrespective of the number

The nine square grid (model) consists of a black base on which stand sixteen white columns placed in such a manner as to form a square consisting of nine equal bays. The design elements, which are used in conjunction with this structure, consist of: grey panels (straight and curved), white volumes (square, cylindrical and triangular), stairs, ramps, horizontal slabs and vaults. The structural constants are the single height grid with round or square columns and the double height grid with round or square columns.



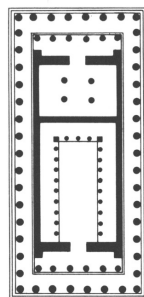
of peripheral bays surrounding it. Once the student understands the essence of core/periphery, then he/she will later determine the number of bays appropriate to a given site and program.

The core-periphery condition of the nine square grid can be interpreted in many ways. One interpretation is that of the core with a periphery of spaces (B.3). With the existence of one central primary space surrounded by eight peripheral secondary spaces, hierarchy is introduced.

The adjacent orthogonal (B.1) and corner diagonal (B.2) placement of these eight peripheral secondary bays, automatically situates them on a symmetrical axis to the primary central bay. These axes, which exist as center lines through each peripheral bay, all converge at the middle point of the central bay. The existence of this singular point explains the powerful presence of the central bay, and elevates it to the conceptual realm of celebrated space.

This singular point, at which all axial lines converge, defines the existence and essence of place. The axial lines through the center of the peripheral bays, describe paths which converge at a given place. The two most fundamental concepts of architecture (simultaneous to core/periphery) are path and place, which both occur on the abstract base plane of the nine square grid. Thus the existence of point, line plane within this architectonic tool.

Another interpretation of the core/periphery condition is that of an enclosed core with a periphery of columns, denoting edge (B.4). This plan exhibits the separation, rather than the convergence, of path and place, with path surrounding place. The principles thus far described are the fundamental plan principles embodied within the structure of the nine square grid. It is not difficult to perceive the relevance of these principles to architectural history. One has only to study the plan of the Parthenon, or that of a Palladian villa to realize that the nine square grid (and its inherent principles) have been extracted as the essence of these plans. The nine square grid is simply an idealization of the underlying structure (and inherent principles) of these plans.



The Parthenon, Core/Periphery

Present within these architectural plans and the nine square grid are the principles and structure of architecture (prior to any discussion of design):

core/periphery	orthogonal/diagonal
hierarchy	axis/cross axis
primary/secondary	edge
inside/outside	symmetry
centrality	point/line/plane
celebrated space	path and place

The primary objectives of the nine square grid are to equip the student with the tools necessary for the design of architecture. These include analysis, the art of architectural drawing, the model as a design tool, and the craft of model making, and finally, design itself.

Analysis

Appropriate placement of form on a given site requires a methodological analysis designed to identify the existing underlying orders of a site. The purpose of analysis is to introduce the student to the previously discussed principles, present within the nine square grid, as well as the numerous permutations of these biaxially symmetrical, ideal conditions. There exist many other intriguing variations on core/periphery within the nine square grid. (See figures C.1 through C.4). These and many other configurations are discovered in the analysis workshop. Once these configurations are discovered, the student is asked to analyze them further, by isolating and extracting the singular layers of symmetry, asymmetry, orthogonal, diagonal, open, closed, etc., which are simultaneously present in any plan, section or elevation.

Finally, the student is asked to compose a few plans of underlying orders containing no fewer than three of the structures (i.e., asymmetrical, diagonal, closed) just previously described. At this point he/she is consciously aware of including these structures into the configurations of underlying orders. This ability to perceive the structures while composing them would not have been possible if he/she had not initially gone through the process of isolating the structures, in order to clearly see them. This process encourages the student to develop an articu-

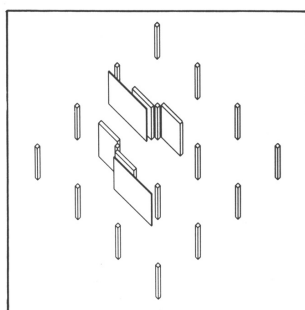
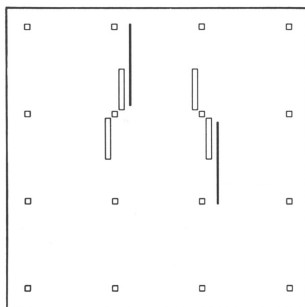
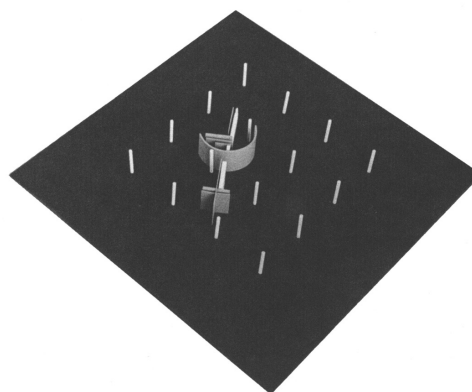
late eye and an analytical approach to perceiving the singular layers contained in a complex piece of architecture.

One should not confuse analysis with design. These underlying orders exist within the nine square grid and are there to be discovered. Design is created. Design is the product of a very personal sensibility which lives within each creative individual. Design inhabits the space of underlying orders, it does not exist to describe them. Underlying orders exist to house design and are no longer literally seen upon completion of a design. Careful examination of the designs presented in this article will reveal that they are inhabiting certain territories within the nine square grid, but certainly do not exist to describe them. Design exists as a home for philosophies and ideas. Underlying orders exist as a home for design.

The nine square grid is a highly responsible tool on which one can substantially develop one's own creative sensibility. The analysis encourages the student to thoroughly understand the tool in order to use it to its full potential. Eventually, the student will approach any project by analyzing the existing conditions and discovering the underlying orders with the intentions of placing form appropriately on a given site.

Projects five and six of the first year program include an analysis of section and elevation. The primary concern of these projects is the transformation of plan through successive planes in vertical space and a study of how this affects section and elevation. They will culminate with a design of section and elevation, respectively, based on the knowledge gained through analysis.

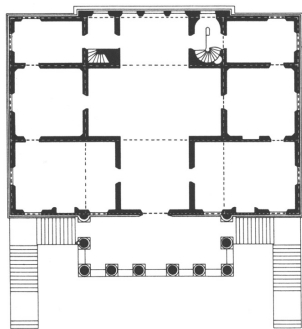
Included in the analysis of plan, section and elevation during first and second term, is an exploration into the existence of harmonic proportions and the interweaving of odd and even number systems within the structure and elements of the nine square grid.

Claude Charron, Project
Three, PathSarah Murray, Project
Four, Monument

The Art of Architectural Drawing

Simultaneous to the analysis, occurs the exercise of drawing the existing structure of the nine square grid. This familiarizes the student with the dimensions of the tool and introduce him/her to the art of architectural description. The student learns to perceive architecture through plan, elevation, section and axonometric.

Pencil drawings require a high degree of concentration and control of the hand, eye and mind coordination. The presentation requirement for Project One is pencil on Strathmore paper, the quality of which exhibits a rigorous emphasis on crisp line quality and precision, encouraging an integrity of thought and intent. The remaining presentations throughout the year are produced with ink on Strathmore paper and must exhibit the same degree of integrity, since the quality of presentation reflects the quality of thought.

Villa Malcontenta,
Andrea Palladio

The Model as a Design Tool and the Craft of Model Making

The model, as a tool, provides the student with a structural constant with which to study the architectonic design issues set forth throughout the year. The presence of the existing structure encourages the student to focus primarily on design issues while simultaneously remaining aware of the integral relationship between structure and design.

Plan is easily perceived and studied through the use of the single height grid while section and elevation are made accessible through the study of the double height grid. The study of section and elevation that occurs during second term, relative to the plan that the student has become familiar with during first term, affords a continuity which allows him/her to quickly address the new issues at hand without having to reorient him/herself to a new structure and plan.

The model is the tool with which the student will produce architectonic designs during the course of the year. The model, as a tool, is the final product and not representational of anything else. The materials with which it is made should reflect its permanent, non-representational qualities (i.e.: birch plywood base, hard wood grids, plexiglass columns, panels, volumes, stairs, ramps and vaults).

The student must focus on the following considerations concerning materials and detailing in order to construct a model of quality. How does a column meet a base? What detail is appropriate for particular materials? What is the resilience of certain materials? What are the inherent qualities of various materials? How does one resolve lines between materials which are abutted, or laminated, to one another, and must appear as one surface in the final product? How does the base meet the surface that it sits on? What is a reveal? What is the availability of materials simultaneous to decision-making?

The student must learn to balance the quality of time, money, and materials. He or she begins to understand how materials are joined, and may be used in conjunction with other materials. The student will have to make final decisions concerning details, materials, and craft which he/she will live with throughout the year. The quality of these decisions as well as the execution of the built product will be exhibited in the elegance and longevity of the tool.

Design

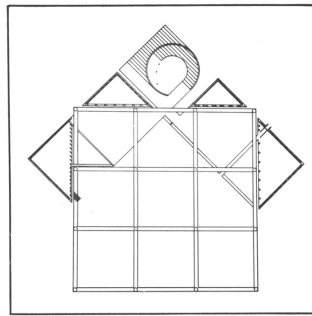
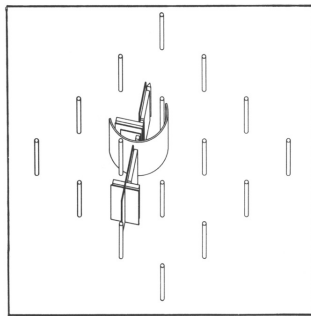
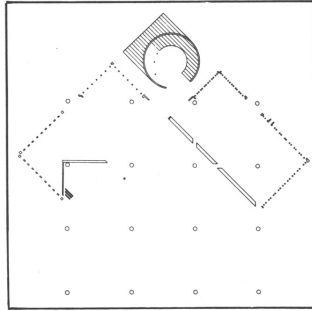
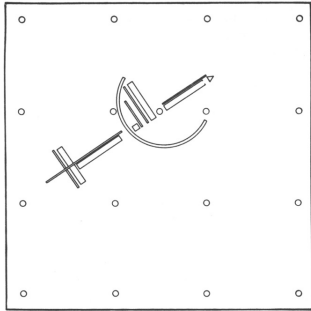
Architectonic design is form which embodies the essence of an idea. The elements and structure of architectonic design exist solely to physically manifest the essence of an idea. The process of architectonic design involves a reduction of elements, in order to arrive at a point of balance such that if any one element were subtracted, added or moved, the design would become imbalanced and the clarity of the idea would be destroyed. It is a reductionist design of precision, balance and beauty which expresses only the essence of an idea.

The purpose of architectonic design is to teach the student to design form which speaks clearly for those concerns which he or she feels are most essential to the intentions of the project. The student begins to internalize a design discipline which will serve to eliminate those elements which are superfluous to his or her ideas and, therefore, superfluous to the architecture. Architectonic design is consistent with architectonics and the nine square grid in that they all seek to define existence of essence.

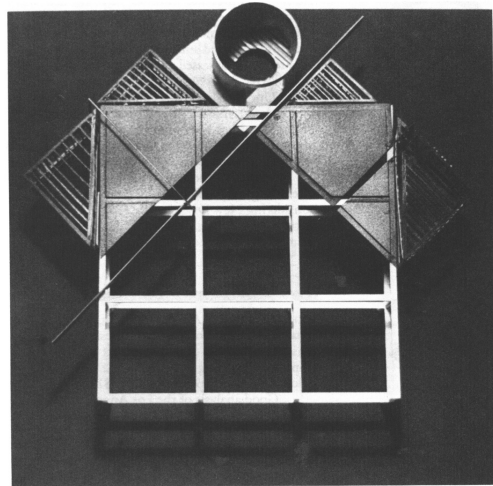
The year is divided into seven cumulative projects which focus primarily on plan, during the first term, and on section and elevation, during the second term. The model and the axonometric drawing are used as design tools throughout the year.

- Project one: ANALYSIS of plan; introduction to architectural drawing and model making.
- Project two: PLACE (Enclosure, pause, celebrated space).
- Project three: PATH (Procession, motion, celebrated journey).
- Project four: MONUMENT (Home for a memory).
- Project five: ANALYSIS of section; design of section.
- Project six: ANALYSIS of elevation; design of façade.
- Project seven: HOME (Inhabitation, dwelling, being).

Term one is comprised of projects one through four and term two of projects five through seven.



Cristiana Viviani,
Project Six, Vertical
Transformation



The first six projects occur in two-week intervals with a one week break between each one, for presentations. The last project is a thesis of the year and is appropriately longer, comprising a total of four weeks.

Project Four (Monument) is a synthesis of the first term. The student is asked to write a short prose or poem concerning the knowledge gained by a significant event in his or her life. The monument is a home for this memory. The student is encouraged to design meaningful form. Project Five and Six begin with Project Four (Monument) as a precedent, and transform it vertically through space. The double height grid is used as the structure to facilitate section and elevation exploration. The student is afforded the valuable opportunity of developing a project beyond the first presentation stage. The design of Project Six will conclude the journey through plan, section and elevation of Projects Four, Five and Six. Projects two through four include analysis and design which occur within the columnar periphery of the nine square grid in order to encourage a thorough understanding of the principles embodied within the tool. Projects five and six may extend beyond the columnar periphery of the nine square grid.

Each design project is comprised of one concept, only a few very specific underlying orders, and a limited number of elements (i.e. CONCEPT: path; UNDERLYING ORDERS: procession, transformation/metamorphosis, repetitions, rhythm/rhythm; ELEMENTS: one black base, sixteen square white columns and no more than nine grey panels; DESIGN INTENTIONS: one symmetrical design as procession through panels and one asymmetrical design as procession of panels).

These restrictions are maintained in order to encourage a highly focused investigation of profoundly fundamental issues. A clarity of the architectonic issues will lead to a sophisticated understanding of the complex volumetric interrelations of architectural events.

With a limited number of elements, the student is able to assume full responsibility for every element and its relationship to the structure and other elements in the design. The resolutions of joints and details become important design considerations:

- How does a panel meet a square column?
- How does a panel meet a round column?
- How does a panel meet a panel?

Conclusion

The nine square grid is an architectural chessboard. The two are both extremely simple structures on which brilliantly masterful manipulations can be performed. To sit down to learn chess and ask if one can remove one or two squares from the board, is to ignore the ingenious potential of the game. Within the strict parameters of the nine square grid, the student's challenge is to be as creative as possible.

The design must work integrally with the structure. Columns cannot be removed for the convenience of a design intention. Initially, this may seem to be an annoying obstacle impeding the creativity of design, but upon closer examination, one often finds that a very elegant detail may be created at the intersection of a column and other design elements.

As the projects become more complex throughout the year, the limits are gradually removed, and the student incorporates the discipline of previous design projects. The final project includes either an urban or rural theoretical site designed to teach the student to address the issues of design orientation, governed by the unique site conditions. This is intended as a 'bridge' project between architectonics and architecture.

The nine square grid is a classic architectural design tool which exists as a biaxially symmetrical structure. It is impeccably thorough in its inclusion of essential concepts, orders and elements of architecture. It is an ideal structure from the world of abstraction, whose beauty lies in the elegant simplicity of such a highly complex object.

Deviation from the nine square grid occurs upon a thorough understanding of the potential that lies within. The student is now prepared to embark upon the challenging task of integrating the abstract world of architectonics with the actual world of architecture. The literal structure of the nine square grid begins to fade, while the concepts of architecture and the knowledge of the masterful manipulation of form, remain ever present.

Lorna McNair is presently a visiting professor at Carleton University, School of Architecture. She is a graduate of the Cooper Union, School for the Advancement of Science and Art, and worked as an architectural designer in the New York office of Skidmore, Owings and Merrill, prior to teaching at Carleton. Her work has been exhibited and published in the United States and Europe. The work presented in this article is designed by her first year students of the 1982-1983 school year at Carleton University.

Dominic Yap-Sam,
Project Seven, Home for a
Family of Five Musical
Instruments

