THE DELAWARE CENTRAL HOSPITAL FOR VETERINARY MEDICINE

MUNCIE, INDIANA

ROBERT T. KULKA

THESIS 1978 - 79
ABSTRACT

The Delaware Central Hospital for Veterinary Medicine is a complete medical facility for the treatment of large and small companion animals. Analogous with a modern human hospital, the central hospital facility is intended to be an extension of the private veterinary clinical practices located throughout the community. The facility will provide 24 hour emergency treatment, complete corrective surgical procedures and supervised extended care for the animal populations of Muncie, Indiana and the surrounding Delaware County area. These services will be supported by comprehensive laboratory, radiology, pharmacy, pathology and research library areas. The hospital will also contain 100 cages, 20 indoor runs and 10 large animal stalls within its projected 28,000 gross square feet. The standards and program requirements are structured within and from the guidelines set forward by the American Animal Hospital Association.
The site on which the hospital is to be located is on the northern fringe of Muncie in a basically residential area. Selection of the site was based primarily on its central location within the county with immediate access to the major transportation network and the potential characteristics of the site itself.

The client was a hypothetical corporation set up by a majority of the practicing veterinarians in the Delaware County area. Analogous with modern medicine the individual veterinarians will soon have to pool their resources in order to provide the high level of care now possible because of rapid advances made continually in veterinary medical science. Only through the use of a central modern fully equipped mixed practice facility could the economic realities and the high standard of practice be compatible.
ACKNOWLEDGEMENTS

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INTRODUCTION

GOALS

Quality Health Care: The principle goal of the Delaware Veterinary Corporation is to provide the best health care possible for all domestic or companion animals both large and small in the Delaware County area. The hospital must be fully equipped with 24 hour care.

Image: The central animal hospital is a new concept to most residents of this area. The site is a residential area so consequently the image of the building must be one which attunes itself to the area yet is distinctive.

Environment: The interior of the facility is composed of five basic zones: a public/private, small animal working, large animal working, kennel or small animal ward area and stable or large animal ward area. Each must reflect the user and the atmosphere required to be a successful space.
The public part of the public/private zone is the only portion of the facility which a majority of animal owners ever will see. First impressions are critical in doctor/patient relationships therefore attention should be focused here. The waiting and lobby space should not appear as a sterile area. The trauma or emotions of the owner with the sick or injured pet are also a consideration. The private portion of this zone are to be used by the staff and vets for hospital business and for their own luxury while at work. Warm workable spaces which enhance activities are separate from yet a part of the same overall zone.

Efficiency: The functional relationships between the zones and the spaces which comprise each zone are extremely important. The overall circulation plan should be straightforward and organized to bring the project or facility together into a cohesive unit. Although each zone is not independent of the others they should be organized as if they they were. Each space should allow the staff and vets to provide the most amount of care possible with a minimum of wasted effort.

Maintenance: The choice of materials is the key to maintaining a clean healthy environment with a minimum staff effort. With animals present throughout most of the facility the selection of flooring and wall surfaces will be paramount.

Energy Efficient: Exterior materials and orientation of the facility must provide as efficient a building as possible. The high energy consumption of the hospital activities within should be offset somewhat by the building itself.
PRIORITIES

Preservation of the natural characteristics of the site was foremost on the list of priorities. Even with the zoning restrictions the usable area far surpassed the programmed footage required for the facility thus violation of the foliage and natural contours could be avoided.

The building entry, both emergency and normal, had to read well enough to be found without conscious thought on the part of the animal owner bringing in an injured pet. This was best achieved through manipulation of the exterior form of the building.

The residential location and size of the facility in conjunction with usable area on the site allows the building to maintain a low profile that for the most part should not exceed one story in height. The overall appearance should be conservative and for economic reasons constructed on conventional locally available materials. The fluted or split rib
masonry unit in a 4 or 6 rib per block pattern might offer a different twist to a conventional material.

The lobby area and waiting room should be the highlights of the facility. The lobby area should be designed to disallow any misinterpretation of the intended circulation from the entry point to the receptionist and eventually the waiting area. The waiting room should be a special area which is large and flexible enough to separate the patients with natural animosities, yet allow control of the space by the receptionist. Distractions such as possible atrium conditions or views out onto the site should be considered to aid in relieving possible tensions acquired by the owner and then passed to the pet. The clinical exam rooms must be near to the waiting area. Once the exam is over or the animal is discharged the route out of the hospital is just as important as the entry. The business office or receptionist should be along the route out so as to insure payment of bills.

Circulation between the different zones and within the zones cannot be under emphasized. The more simple the solution the more efficient it will probably be. Adjacency of activities is one determinant of many circulation problems and solutions. The other determinant will be the process flow through the zones according to the amount of care needed by the patient.

The final building should allow for flexibility and future additions as the need may arise or technology progress. The structural system to be used should allow for flexibility within the working zones without affecting the exterior or form of the building.
BRIEF

This brief is intended to provide quick overview summaries of major portions of the building program for this facility. Among these parts are the site analysis summary, the building type summary and the space requirements as determined from my research and the standards recommended by the controlling organizations. The complete versions are located in the appendix to this text.
SITE SUMMARY

The site selected for this project has played an extremely important role in the final orientation and form of the building. The triangular shape in conjunction with the zoning restrictions, the grassy plateau in the south west corner, the heavy peripheral large vegetation and the creek were all major contributions to the design process and evolution of the facility. The influence of each part should be apparent from the before and after images. Further explanations occurs in the process portion of the book.
BUILDING TYPE SUMMARY

Throughout the entire thesis project no example of a full service mixed practice central hospital was discovered for a direct comparison. The program and final product were compiled from examples of other smaller central facilities that either specialized in large or small animals or from other private mixed practice clinics. The results of this effort though from different and scattered sources did have common concepts of circulation, adjacency and hierarchy of order.

The circulation of each example was straightforward and simple. The client was funneled from entry to waiting, to exam and finally passed the business end of the facility. The animal or patient circulation was determined by the degree of care the animal required before discharge or termination. Also this patient circulation appeared analogous to the hierarchy of order of spaces. The more sickly or damaged the animal the farther
into the hierarchy of spaces it progress-
ed.

The exterior treatment of the fa-
cades were handled in many different ways so a definite pattern or set of guidelines could not be established to help to solve the residential interface problem.

SPACE REQUIREMENTS SUMMARY

The following figures are those that were programmed to be necessary in the beginning. In most cases the footage remained close to what was programmed for the individual spaces but inflation did occur in certain areas. Circulation, the lobby/waiting area, the large animal receiving and the duplication of lab/pharmacy and radiology areas are the principle causes for the 8,000 gross square feet increase in the final project.

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SCHEMATIC DESIGN

Four separate schematic designs were worked up in the beginning phase of the project. Each was to explore possibilities and approaches to determine what is the most feasible approach to solving the project at least in schematic form. The zone zone breakdown of the spaces required in the facility program enabled me to work on possible solutions in a more abstract level than most. I knew that the individual pieces of each zone would work themselves out eventually due to the programed adjacency and process flow but the organization of zones in conjunction with the extended influence of the site was to be the primary concern. The sharing of the laboratory and pharmacy facilities between large and small animal working zones was a determinant influence on each solution.
CONCEPT I

The first schematic concept was an attempt to provide a solution using the largest area as a hub from which the other components form a cluster around it. Emergency entries for both working zones are separate from the main entry with attention given to a drive through large animal receiving. The progression from public, to working, to ward areas set the stage for the necessary process flow through the facility but lacks conviction. Circulation is provided by a single spinal corridor with branches to each side. The lack of site orientation and the dominance of a vehicular drive that loops completely around the form violates the site. Views and topographical highlights are neglected.
CONCEPT II

The second schematic design was derived in a completely separate manner using a cross concept but the influence of the first schematic is apparent. The public/private zone formed the foot of the cross with the working areas, the shaft and the crossmember made up by the ward areas. A central spinal interior circulation system is combined into a single focal point. An attempt to exploit the geometry of the site is present but large animal emergency and drive through chew up a lot of the site. One strong point is the relative close proximity of the stable/receiving zone to the public zone.
CONCEPT III

The geometry of the site in conjunction with the process flow and relative size proportions of the zones generated this scheme. A central lobby separates the public/private zone into two parts. The working zones are adjacent and the wards are back along the creek. This was the first scheme which attempted to allow at least the staff to enjoy the view along the creek.
CONCEPT IV

A combined emergency area for both large and small working zones tucked under the public zone generated this schematic design. The use of the building as a wall to frame a view along the creek also appears as a criteria. It was this scheme which I felt had the most potential for future development. Circulation on the site was improved over the other 3 schemes yet still is not as clear as possible. Confusion between emergency and normal circulation paths and the level changes within the scheme need to be resolved. It was also suggested in the presentation crits that the public area be opened up or punched back through to allow more use of the views being framed. The entry was also at the least likely point which adds to confusion in circulation.
PHASE 1

PRELIMINARY DESIGN

After careful review each of the first four schematic designs were put aside. The lessons learned from each scheme were noted and from this criteria a basic set of restraints were established to help attack the problem again.

The most important restraint which severely limited the first schematic designs was the adjacency of the two working areas to share common like parts between the two zones. This deletion removed the shackles which inhibited greater interaction with the site.

A reverence for the site was established in order to preserve its natural highlights. The framed views down along the creek were retained as a design criteria for the public/private zone. Circulation henceforth is to be as straightforward as possible without sacrificing any grass for asphalt unless absolutely necessary.

A central node concept with two
individual wings sprang from this set of design criteria. The wings are parallel with the hypotenuse of the site triangle and offset to allow a view down the creek to the north west. The central node is the public/private zone and each wing corresponds with the large and small animal parts of the facility. The central node and each ward zone were orientated perpendicular to the leg adjacent to the hypotenuse of the zone restriction triangle.

The spaces within each zone were developed according to the program guidelines. The transition areas between the working zones and the ward zones created many problems both in structure and the creation of many odd shaped rooms. Further criticism was received in light of a weak circulation pattern which did not act as a unifying element between the zones. The elevation drew some flack but I felt most of it was unwarranted. The overall form gradually stepped or terraced up to the central node then it declines in height in the same manner.
PHASE 2

DESIGN DEVELOPMENT

The final overall form, structure and circulation patterns are established by this phase of the development. Based on previous jury criticism the two major wings of the hospital were shifted in towards a central axis line. The move established a central spine of circulation which transverses almost the entire facility. The two ward zones were pivoted at right angles to the working zones thus alleviating the structural problems and allowing more conventional spaces to be created. The terraced form was dropped for a standard elevation height in the two wings. This was done for structured uniformity and for the fact that the zones were starting to blend together slightly which eroded the strict definition of the zone.

The elevations were developed according to the structural columns 9'-4" o.c. and the circulation patterns within the facility. The vertical windows used for
two basic reasons: the vertical element on a corridor frames a view out thus allowing glimpses of what is out on the site, the vertical light element would create a sculpture of light across the floor and up the interior wall at ever changing angles.

The jury went well with minor criticism on little details. It was suggested that the elevations be analyzed again with the possible addition of a horizontal pattern of glass. It does look like a school.
PHASE 3

FINAL DESIGN

With the floor plans pretty well finalized I felt it might be a good idea to ask Dr. Neil Perrill, a local vet, to crit them for me. His responses were interesting and recommendations quite valid. First he felt that the lab/pharmacy area was too small and should be expanded across that whole area adjacent to the exam rooms. The displaced treatment areas should be shifted to a point midway between the aseptic surgery and the wards. He explained that treatment areas are generally considered as dirty surgery rooms and in their present location were too far from the wards to be practical. The other adjacencies were still valid though. The other major criticism was in the loose control of the waiting lobby area. If that area could be tightened up it would help the receptionist have better control over the situation. By simply moving one wall forward more control was established. The
The entry foyer was also brought further in to accent the entry/lobby transition and provide more control over the lobby.

The elevations were revised by introducing a recessed horizontal window that is flush with the interior of the 12" fluted block masonry wall. The top of the window is even with the ceilings in the corridors and rooms thus providing indirect sources of light. The vertical element of windows is flush with the exterior of the wall thus offering a variance in usage. The only exception to this vocabulary is the large windows located in the waiting room. Here the vocabulary is reversed with the lower windows recessed and the upper flush with the exterior.

Skylights were added to the ceiling grid to accent the receptionist desks and the flooring pattern reinforces this notion. The waiting area was finalized by the addition of six 6' diameter concrete planters. The planters are 20 inches off the floor and the rim of each provides the seating for the space. Small trees are to be places in these planters thus enhancing and reinforcing the indoor/outdoor relationship of the space.
WAITING AREA
APPENDIX

PROGRAM
SITE ANALYSIS
BUILDING TYPE STUDY
A BUILDING PROGRAM
FOR

THE DELAWARE CENTRAL HOSPITAL
FOR VETERINARY MEDICINE

A COMPLETE VETERINARY HOSPITAL FACILITY
FOR BOTH LARGE AND SMALL BREEDS OF
COMPANION ANIMALS SERVING ALL OF THE
MUNCIE - DELAWARE COUNTY AREA
THE DELAWARE CENTRAL HOSPITAL
FOR VETERINARY MEDICINE

MUNCIE, INDIANA

CLIENT:

DELAWARE CENTRAL HOSPITAL CORPORATION
C.R. 150 W. RIGGIN ROAD
MUNCIE, INDIANA

AUTHOR:

ROBERT T. KULKA
1911 ENGLE DRIVE
MUNCIE, INDIANA 47302

OCTOBER 9, 1978
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SUMMARY

The Delaware Central Hospital for Veterinary Medicine is a complete medical facility for the treatment of large and small breeds of companion animals. Analogous to modern human hospitals, the facility will provide 24 hour emergency treatment, complete corrective surgical procedures and supervised extended care to the animal population of the community. These services will be supported by comprehensive laboratory, radiology, pharmacy, pathology and research library areas. The hospital will also contain 100 cages, 20 indoor runs and 10 large animal stalls within its projected 28,000 gross square feet.

The site on which the hospital is to be located is on the northern fringe of Muncie, Indiana, the county seat for Delaware County. Centrally located in terms of access from the major transportation networks and from the different locations of the practicing vets the site is almost right triangle in shape with 7.25 acres of land. Bordered to the south by Riggin Road and Moore Road to the north the site comprises the western portion of 4900 block of N. Wheeling (300N. & 150W.) Key features included a small creek which flows along the eastern boundary, a fairly flat meadowlike topography and ring of large trees completely around the parcel of land.

The sole controlling entity behind the hospital is the Delaware Veterinary Corporation which is made up of a majority of the practicing veterinarians in the central Delaware County area. On the strength of sharing a common philosophy towards veterinary medicine the corporation was founded to enable each veterinarian to practice the highest level of animal health care possible. Only through the use of a modern fully equipped mixed practice facility could this standard of practice be achieved.
BACKGROUND

The future of veterinary medicine is considered by its practitioners to be at a crossroads in its current level of development. Akin to modern medicine at the turn of the century the veterinarian of today is in the position of the early horse and buggy physician. Veterinary science is becoming an ever exacting field both physically and economically. The quantity and quality of health care received by the animal is directly related to the vet's economic position (i.e. his facility and equipment), his supporting staff and his professionalism.

Societies' attitude towards animal health care, the continuing forces of education and the suppliers force upon the veterinarian a never ending cycle of costly facility updating and improvement. Though morally obligated to meet current standards, the economics involved eventually prohibit most vets from meeting them. As a result, the practitioner is hampered in his efforts to provide really complete service to the community.

The central animal hospital concept is the only viable solution to this problem. Analogous to modern medicine and its hospitals this concept provides many advantages to the vet and patient that otherwise would be economically unobtainable for most practitioners.

In the not to distant future the vet will have little option but associate with a central hospital facility to provide complete care or reduce his services to strictly an outpatient clinic level of care. As with any coming trend in facilities it is the architectural field which must have the capability of responding to and bear the responsibility of pioneering in the design and planning of these buildings.
The Delaware Central Animal Hospital for Veterinary Medicine is a response to this future healthcare demand. Muncie and the surrounding county area offers a unique urban fringe/rural setting which could support a large central hospital whose facilities are geared for both large and small breeds of companion animals.

**SCOPE**

The scope of this program is to establish the design criteria for a large central animal hospital which cares for both large and small breeds in the Muncie - Delaware County area. In order to establish the constraints which the design of this facility must respond to the program is organized by the issues which affect the project. These issues include the specific goals, the client and users, the services to be provided, organizational data, the spatial requirements and adjacency, the site, codes and a study of other similar prototypical buildings.
CRITICAL ISSUES

Quality Health Care: The principle goal of the Delaware Veterinary Corporation is to provide the best health care possible for all domestic or companion animals both large and small in the Delaware County area. The hospital must be fully equipped with 24 hour care.

Image: The central animal hospital is a new concept to most residents of this area. As the site is adjacent to and presently zoned residential area the image of the building must be given a great amount of consideration. A professional building should reflect this quality yet need not be stereotyped similar to a comparable human facility.

Environment: The interior of the facility is comprised of five zones: a public, a private, a medical working, a kennel and a large animal. Each must reflect the user and the atmosphere required to be a successful space. The public zone is the only area that a majority of pet owners are allowed to see. First impressions are critical in doctor/patients relationships. The public zone spaces need not appear to be sterile. The trauma or emotions of the owner of the sick or injured pet are a consideration. The private zone consists of spaces used by the staff and vets for hospital business, rest or conferences. Warm workable spaces which enhance activities are to be programmed. The working, kennel and large animal zone is the heart of the facility with the treatment, surgery and associates spaces. Efficiency and cleanliness with an atmosphere conducive for professionalism is recommended.
Efficiency: The functional relationship of the spaces is extremely important. The plan must work. Each space should allow the staff and vets to provide the most amount of care possible with a minimum of wasted effort. Any plan innovation which will save one step per client visit can be evaluated in thousands of dollars over the life of the building.

Maintenance: Ease of maintenance is another objective. In order to provide the best service a clean environment is a necessity. Maintenance of sanitary conditions can be a problem with animals present throughout most of the facility. Each material must be carefully chosen to allow quick thorough cleaning, yet need not be sterile or impersonal.

Energy Efficiency: The building must be as energy efficient as possible to lower operating costs. Much of the increase in fuel costs must be absorbed by the business. The client will not tolerate consistent rate increases over a short period. Passive solar design can be included but is not a mandatory consideration.

CLIENT DESCRIPTION

The Delaware Veterinary Corporation is the sole entity controlling the central hospital facility. Formed by a majority of the veterinarians in Delaware County, the corporation has ten principle members. Each vet has totally equal status with the other members. General stock in the facility is available to the public but the ten principle members comprise the board of directors and this control the hospital. All decisions ultimately rest with the board and the respective committee.

The staff at twenty members is made up of the ten principle vets, two resident interns, 6 full time employees and 2 part time helpers. The ten principle vets alternate on a regular basis with each other to stand in for the interns on their days off or act in a supporting role to the resident vets on emergency duties. The principles each maintain their regular practices but strictly on an outpatient and routine maintenance level. All members are bound to a mutual agreement to use the central hospital facility whenever major surgery, extended care or emergency situations arise. This arrangement in no way inhibits their practices yet relieves the vets of the 24 hour demand for emergency service and care, the individual purchases of expensive equipment and cost of maintaining a large facility of their own. All surgery is scheduled ahead of time when possible.

The two resident vets are recent graduates from college serving a one year internship with the facility. The extended care and emergency room supervision responsibilities are picked by these two staff members when other vets are not available.
The six member supporting staff is comprised of one receptionist, a secretary/bookkeeper, three lab technicians and a full time maintenance person. Each of the three technicians have special training in certain areas such as radiology, virology and pharmacology which greatly aids the veterinarians. Comparable with the registered nurse, the technicians also provide assistance in treatment and surgery.

The part time helpers consist of high school or college age youths interested in a possible future in veterinary medicine which assist in maintenance, office work and general custodial duty around the hospital.

FUNCTIONS

The American Animal Hospital Association defines a central hospital "as a facility established to supply examination, diagnostic and prophylactic services and medical and surgical treatment to companion animals and equipped to provide housing and nursing care for them during illness and/or convalescence." The following service requirements are mandatory according to the A.A.H.A. standards of practice in order to obtain certification with this organization.

Records: There must be an individual medical record maintained on every patient administered to by the hospital.

Examination: Examination facilities shall be provided.

Pharmacy: Facilities shall be provided for the storage, safekeeping and preparation of drugs, following Federal and state laws.

Clinical Pathology: Clinical pathological services shall be provided.

Radiology: The hospital shall provide a diagnostic radiographic department. The service shall be performed on the premises.

Surgery: A separate department for major surgical procedures shall be provided.

Dentistry: Dental services, including prophylaxis, preventive care, shall be provided.

Diagnostic and Clinical Services: Diagnostic and clinical services shall be provided.
Library: A medical library consisting of basic textbooks and current periodicals shall be provided.

Anesthesia: Anesthetic services shall be provided.

Nursing Care: Nursing care shall be provided.

Emergency Service: Emergency service shall be provided and readily available at all times.

Housekeeping: There shall be a housekeeping department which shall be responsible for a safe, functional and pleasant environment for clients, patients and employees of the hospital.

Maintenance: There shall be a constant maintenance program to provide a safe, functional and pleasant environment for clients, patients and employees.

ORGANIZATIONAL DATA

To further understand the functions and duties of the staff members as they relate to the individual spaces, their usage and organization, the following format will be categorized by:

I. Five Principle Activity Zones and Their Users

II. The Process Flow Through the Zones

I. There Are Five Principle Activity Zones And Corresponding Users

The hospital is organized into five major activity/user related zones for two reasons. The first is to establish the functional relationships within the facility such as the interaction of the spaces and their activities with other related spaces and functions. From these relationships process flow patterns of the client, patient and the employee can be determined and understood. The second reason is to control offensive odors and distracting noises from one area to the next.

The five major zones appropriate for most central animal hospitals are: public zone, private zone, work zone, kennel zone, and large animal zone.

A. Public Zone

The public zone must be close to the parking area with the public entry and exit on the same side of the building as the parking lot. Since this is the main zone the clients will use, it should receive the greatest
amount of architectural treatment in terms of client convenience and interior design. This zone has the visual impact and comfort which projects the image of the company and the veterinarians. The client must feel welcome and comfortable while waiting yet the professional atmosphere must be maintained.

There are seven sub units which comprise the public zone: reception area, waiting rooms, public water closets, exam rooms, business office, records and the emergency area.

1.) Reception area: Entrance should give immediate access to receptionist. The receptionist must be in a position to have full control over the entire area. It is her responsibility to greet any incoming clients and stop the outgoing traffic to insure payment. Not only is she a traffic guide but she must also be close enough to the ward area to retrieve released animals and near the pharmacy to dispense any prescriptions.

2.) Waiting rooms: Good design is extremely important in the waiting area as many times it is all that most clients, deliverymen and friends might see of the hospital. It will be only natural for many persons to base their opinions of the entire hospital upon its appearance and condition.

The waiting rooms should be easy to maneuver to and around with a definite sense of entry from the exterior of the building to the receptionist and into the area. It must be remembered that many callers will be accompanied by frisky or reluctant pets and small children.

A separate waiting area for both feline and canine is recommended by many vets. The extra cost is outweighed many times by client convenience especially for the cat owners. Adequate room size is important both for comfort and to retard spread of disease. Pre exposure to the doctor is also not recommended if possible.

Careful selection of attractive materials that can withstand heavy wear, some abuse and be easy to clean is crucial. Seating should be carefully chosen to facilitate ease of maintenance and the provision of a place of refuge for many wary pets.

3.) Examination rooms: In virtually all modern plans the exam rooms are adjacent to the lab-pharmacy to make extra drugs and supplies available. Exam rooms are also near enough to the wards to make any hospitalization convenient. The size of the rooms is also important. Many vets feel that a smaller exam room allows greater control of the animal in a typical examination situation.

There will be a minimum of 8 exam rooms located in the facility preferably off a central corridor from the waiting room. Route from reception room to examination rooms should be direct. The possibility of clients being confused or getting lost should not exist.

4.) Public Water Closets: A toilet facility should be conveniently available for use by clients but not directly adjoining reception area.

5.) Business office: The secretary/bookkeeper utilizes this space to expedite hospital business matters ranging from billing to ordering of supplies. Located near the receptionist area the office will also be used by the receptionist when other duties aren't pressing. The exit route from examination rooms should pass directly past the receptionist/business area, but not through the reception area. A small counter should be available for payment of account. A limited degree of privacy should be available so that
the client feels free to discuss charges in detail.

6.) Records: Importance of space not to be discounted. The storage of these documents furnish the facility with basis for planning and evaluation of patient care. Security is to be considered. Principle users are the secretary, the vets and possibly the tech, assistants.

7.) Emergencies: Flow of emergency cases should vary from ordinary surgical cases in only one respect. A direct entrance route from parking area to the surgery-prep-treatment area should be provided. A separate small waiting and an exam room are to be set aside for emergency use only.

B. Private Zone

The private zone consists of the private veterinarian offices, a research library, a conference room, the vet and staff lounge and water closets. This zone is to be separate from the public. The efficiency of the staff is somewhat related to their ability to find a space for contemplation and quiet relaxation.

1.) Offices: Individual veterinarian offices are considered a luxury in most central hospital facilities but the Delaware Central is not so inclined. A minimum of eight is required.

2.) Library: Used for reference and the study of current literature the library is to be used by all the vets and staff.

3.) Conference: Corporation board meetings dominate the usage of the space. Consultation between the veterinarian and client may also occur but is limited.

4.) Lounge: The lounge is best placed away from the main flow of clients and should be far enough from work area to be away from noise and odor. Generally it is located off a hallway between the work and public zones. Provisions for coat storage and relaxation should be considered.

5.) Staff water closets: These facilities include complete shower and locker considerations to enable the vet or staff member to clean up before or after surgery.
C. Working Zone

Comprised of 15 different parts the working zone is the heart of the central hospital. Adjacency and circulation are critical issues in this zone.

1. & 2.) Pharmacy & Laboratory: The location of these spaces is very important. They serve the whole hospital at some time or another. Accessibility from the large animal treatment area, the receptionist and the examination spaces is a dominant design feature. This allows quick distribution of needed prescriptions and delivery of any lab specimens for analysis. Principle users of the spaces are the technician assistants.

3. & 4.) Radiology & Darkroom: The radiology department is to be located near the operating room and proximate exam rooms. It is common practice to bring in a patient to verify condition by x-rays. Like the lab-pharmacy the radiology room must serve both large and small animals surgeries. Proper equipment can handle both sizes of animals. The darkroom is immediately convenient to the radiology room.

5.) Treatment-surgical prep: Location of the treatment-surgical prep room is critical. This is the terminal point in the work area, the place where most work is done. The space must be proximate to the lab-pharmacy, surgery, x-ray and wards. The size of this area must be large enough to allow a great variety of work and permit heavy traffic flow without congestion.
6.) Scrub room: A separate pre-surgery scrub area is a recommended feature with direct access to the surgery area. Hardware will require special consideration.

7.) Small animal surgery: A good operating room has two basic requirements: quiet and freedom from disturbance. To insure these conditions the surgery is required to be situated apart from the traffic and routine business in the hospital. Thus the operating is generally far removed from the examination rooms and reception area. The operating room is never to be used as a pathway for hospital personnel. An aseptic environment must be maintained at all times. Any traffic would disturb this requirement so the area is to be used strictly for surgery and no other activity. Lighting, medical gas supply and HVAC are prime concerns.

Mechanically, this area should be served by an independent air handling system and maintain a positive pressure in order to avoid infiltration of contaminated air.

8.) Ancillary: This area should be placed near the surgical/prep and surgery serving as the center for the preparation of sterile items for surgery. Storage of the surgical bundles should be such that easy access from the operating room is provided. Washer, dryer, autoclave sink and work counter must be arranged to provide maximum efficiency for the staff personnel.

9.) Trauma: Once an injured animal is admitted to the hospital through the emergency area they are placed in the trauma room. Once the vet and staff first try to stabilize the patient's condition before any treatment or repair work is done. Adjacency - radiology, pharmacology and surgery.

10.) Dental: An area separate from the operating room shall be assigned for the performance of routine dental prophylaxis. Adjacency - exam rooms and treatment/surgical prep.

11.) Intensive Care Ward: After surgery or stabilization in the trauma area the I.C. ward provides constant supervision to critical level animals. Adjacency - treatment/surgical preparation area as generally there will always be a vet or assistant in the area to supervise.

12.) Food-prep: The food prep room is placed near the wards and runs. Ease of stocking also affects location as it is not advisable to transverse the public zone to stock the food. Sufficient space is provided for storage of canned and dry pet foods.

13.) Isolation: This area houses infectious animals which would be isolated from the rest of the ward area. It should be located to provide minimal exposure to the other animals. Ventilation must be given special consideration so as to not spread disease in this manner.

The size must be large enough to accommodate several cages and runs.

14.) Autopsy: Post mortum clinical pathology services are to be provided with owner permission upon all animals. This space in conjunction with the lab is to provide this

15.) Crematory: Local zoning codes prohibit burial of animals within the municipal area. Cremation is the recommended alternative. The crematory need not be a separate space but may be incorporated within another area of the hospital facility.
D. Kennel Zone

The kennel zone consists of the wards, exercise stalls and a grooming area. Where boarding is to be combined with a medical practice, other than as an incidental convenience for clients, special consideration should be given to insure efficient operation without interference with the professional practice. Incidental boarding will be handled efficiently by a plan which satisfies the requirements for handling of surgical cases.

1.) Ward rooms: The ward room in an animal hospital in analogous to that of the human version. It is a space where cages are used in place of beds for the patients to recover in. Three wards are typical, two for general hospitalization and one for animals suspected of having a communicable disease. This also enable the staff to group similar cases together in groups of adjacent cages.

The size of the wards should allow the accommodation of a double row of cages placed back to back. This reduces barking between canines that face each other.

The ward room should be adjacent to the exercise stalls, treatment area and food prep rooms, yet not far from the receptionists. A buffer zone such as a hallway will reduce noise levels in the treatment rooms caused by the wards.

2.) Exercise stalls or runs: The runs enable the animals to work off energy accumulated while caged. It has also been suggested that an animal will heal faster with some amounts of exercise. A 3 x 8 area is an adequate area for most dogs to move conveniently. A ratio of one - four animal runs to cages is preferable giving the animal a chance at quicker recovery.

The exercise stalls are located close to wards and food prep room. Generally the runs are placed as far from public zone as possible but it is the receptionist who many times has to retrieve an animal from them.

The construction of the runs must be easily maintainable with good drainage and excellent resistance to natural body acids that will be excreted from time to time. Visual separation of the adjacent animals is also required.

3.) Grooming - medical bathing: Location will depend on whether the facility is to be used for grooming or strictly medical therapeutic procedures or whether grooming will be offered as a service. Location of this facility should consider the staff assistants who will use them. The floor should pitch to a central drain to allow for treatment of larger animals on the floor. If the grooming room is not adjacent to exercise runs, run should be provided. Several cages should be located in the area with provisions for electrical dryers if desired.

E. Large Animal Zone

The large animal zone is comprised of clinical, surgical, ward, feed and farrier areas. Heating ventilation and air conditioning are major considerations. Controlling odor and noise between zones will be a major problem.

1.) Surgical area: The surgical area is actually three units: a surgery room, a preparation area and a recovery stall. Radiology should be near the large animal surgery and pen areas. The size must be large enough for a horse or cow to recover from surgery safely. Also it must be sufficient in size to accommodate the large hydraulic surgical table when raised into position.
and adequate work space. Both floors and walls should be padded in the surgical area with no projecting objects to injure a groggy animal.

2.) Pens & Stalls: They are comparable to the cages at the small animal level. They are for the recovery of the animal but since only surgical cases and serious emergencies are hospitalized only three are required. These areas should be placed towards the rear of the large animal hospital to insure the most quiet area possible away from traffic flow. The size of the pens or stalls should be adequate to allow movement for a large companion animal.

3.) Feed room: The principle function of this room is to provide storage of feed, and other miscellaneous items. It should be placed near the pens for ease of feeding and have some access for food delivery.

4.) Holding pen, chutes & stocks: These items should be included to aid in the unloading, holding and loading process of the large animals at the hospital. The holding pen should be large enough to retain at least a dozen head of cattle at one time. The chute and stock are to be positioned close to each other and near equipment and drug facilities. A separate nursery area is required adjacent to the holding pens.

F. Miscellaneous areas: The remainder of the facility is composed of support, storage and maintenance areas. A great deal of storage is needed in any medical facility due to the rapid turn over rate of specific items that are used only once then disposed of. Although each space has its own storage general stocks must be maintained. Sheltered parking for transport vehicles is necessary. Maintenance refers to both custodial and repair - upkeep of the facility. Storage for cleaning supplies and equipment must be distributed throughout the facility. The mechanical requirements of a hospital are more extensive than most other facilities. Air filtration and exchange rates, medical gas and vacuum all contribute to the standard utilities supplied.

II. Process Flow Through The Zones

The process flow or user/work flow through the five zones can be divided into two paths; that of the small animal health services and the large animal portion of the services.

The amount of penetration that the typical small animal patient has into the first three zones is directly related to the seriousness of the animal's condition. Normal checkups and the administration of shots will rarely place the client/patient, veterinarian and staff members out of the public zone. The areas used in this activity process flow would be the receptionist, the waiting, the examination and then back to the receptionist. If major surgery is required it could possibly involve every part of the public, working and kennel zone at one time or another before the patient is released.

The large animal service or process flow is somewhat different due to the physical nature of the animals. Value, size, weight and/or number generally discourage the owners from transporting the animals to the hospital for normal preventive maintenance of the animals health. Most of this service is performed in the animals own environment. If a condition does appear that requires further treatment than can be administered in the field, transport is then necessary. Unless major surgery is required or complications arise there is usually no need to retain or hospitalize the
animal.

The following chart diagrams the interrelationships and work flow through the principle activity zones.
## SPACE REQUIREMENTS

### PUBLIC ZONE

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<thead>
<tr>
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<tr>
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<td>Scrub</td>
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<td>Food Preparation</td>
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<td><strong>KENNEL ZONE</strong></td>
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<tr>
<td>-----------------</td>
<td>-------</td>
<td></td>
</tr>
<tr>
<td>Wards</td>
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<tr>
<td>Runs</td>
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<td>Ward stalls</td>
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<td>Peed</td>
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<td>Farrier/Tack</td>
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<th><strong>MISCELLANEOUS</strong></th>
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<td>General storage</td>
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<td>Vehicle storage</td>
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<td>- small</td>
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<tr>
<td>- large</td>
<td>600</td>
</tr>
<tr>
<td>Custodial</td>
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<tr>
<td>Mechanical</td>
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<td><strong>Total</strong></td>
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</table>

| **Future expansion x 12%** | 2,200 |
| **Circulation/structure/ mechanical x 40%** | 7,350 |
| **Gross Total**            | 27,910 |

| **Net Total**              | 18,360 |
| **Parking 200/car (30)**  | 6000   |
| **500/truck & trailer (2)**| 1000   |
CODES

The Delaware Central Hospital for Veterinary Medicine shall comply with all rules, regulations and appropriate codes as they exist on the local, state and federal levels. Specifically this list includes the American Animal Hospital Association manual of standards, the Uniform Building Code and the Delaware - Muncie Metropolitan Plan Commission. For applicable local zoning codes and restrictions consult site analysis section of program.
SITE ANALYSIS
DELAWARE COUNTY:

Delaware County lies in the east central region of Indiana and is surrounded by the counties of Grant, Blackford, Jay, Randolph, Henry, and Madison. Muncie is the central city of the region and the only area with an extensive manufacturing and industrial base. The remaining land area of the county supports agricultural land uses, especially for the growing of crops such as corn, soybeans, alfalfa, and winter wheat.

In 1963, Delaware County became a second class county on the basis of the population-assessed valuation ratio formula. The size of the county is 254,720 acres with 200,950 acres under cultivation. Towns in the county of relative importance and their approximate populations are: Albany (2,100), Daleville (1,600), Eaton (1,600), and Yorktown (1,200).

The Delaware County population can be projected by analyzing the results of the 1960 and the 1970 census data.

<table>
<thead>
<tr>
<th>Year</th>
<th>Population</th>
<th>Percentage Increase</th>
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<tbody>
<tr>
<td>1970</td>
<td>129,000</td>
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<tr>
<td>1975</td>
<td>139,700</td>
<td>8.3% increase</td>
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<tr>
<td>1980</td>
<td>151,100</td>
<td>8.2% increase</td>
</tr>
<tr>
<td>1985</td>
<td>163,300</td>
<td>8.1% increase</td>
</tr>
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The land is zoned only in the Muncie proper area.
CITY:

Muncie is the eighth largest city in Indiana and is located 54 miles northeast of Indianapolis. It is the only city in the Delaware county boundaries and is the county seat. Heavy and medium industry characterize the economic background of the city. Muncie is greatly influenced by Interstate 69 which passes 12 miles to the west and links with Indianapolis to the southwest and Fort Wayne to the northeast.

The regional transportation network consists of Highways 67 (north-south), 35 (north-south), 3 (north-south), 32 (east-west), and the Highway 67 bypass. Within Muncie the primary arteries are Madison Avenue (north-south), Jackson Street (east-west), Wheeling Avenue (north-south), Kilroe Avenue (east-west), Walnut Street (north-south), and Tillotson Avenue (north-south). In addition there exists airport facilities, inter-city and intra-city bus routes, and several railroads.

Utilities are provided to most residents by the public service companies: Bell Telephone, Indiana and Michigan Electric Company and Muncie Water Works.
The site is approximately 7.25 acres of land located within the incorporated area of Muncie in the northwest corner. Presently the site is privately owned and part of a 24.4 acre tract bounded by Riggin, Wheeling and Moore Roads to the South, East and North respectively. The principle criteria for the selection of this particular site is:

- central county location
- direct accessibility from the major network of county roads which converge on Muncie
- an urban fringe/rural setting
- the owner-veterinarians are not more than a 25 minute drive from the facility
- an attractive site with existing natural vegetation of good stature and good drainage

Selection from the other parts of this 24.4 acre tract were discounted due to disadvantageous, highly commercial potential of the land adjoining Wheeling Pike and the corresponding higher purchase price. The heavy traffic and noise off of Wheeling further discounts these tracts. Riggin Road offers good access to the site from either the west or east yet the present amount of traffic is light.
ZONE RESTRICTIONS:

The proposed site is presently zoned residential. In order to build a central animal hospital the classification must be changed to either variety business or farm. Based on conversations with members of the Planning Dept. of the city of Muncie it appears that little difficulty would arise in rezoning the land. Eventually the parcel of land adjacent to Wheeling will be rezoned variety business. This project is merely paving the way. Any major opposition from the public would be handled in two ways: an education campaign to explain what the facility is so as to resolve any hearsay or misnomers that might be circulating, and the donation of the extreme north wooded section of the site to the city as a park for the local children to play.

Variety Business
General Restrictions: -150 min. frontage
-2 1/2 stories or 45' ht.
-30,000 sq. ft. min. lot.
-50' front setback
-25' side setback
-50' back setback

Specific Restrictions: -Animal and Veterinary hospitals, provided all buildings and structures shall be not less than two hundred feet from any residence, school, church, hospital or institution for human care.
-2 parking spaces per every 3-4 cages or runs.
The key issue in site selection is accessibility. The most feasible access point to this site is from Riggin Road to the south. Riggin Rd. is a major east-west county highway which divides Hamilton and Central Townships. It provides an access route tying in the major northern roads before entering the municipal boundaries of the city. Traffic by the site on Riggin is light to moderate depending on the period of the day. Wheeling Pike on the other hand services an extremely heavy amount of traffic at all times of the day. Once designated old U.S. 35 urban sprawl is rapidly spreading north along it. In fact, the site was incorporated into the city within the last six months.
TOPOGRAPHY & VEGETATION:

The site is almost flat with little change in grade. The only interruption of this surface is the Green Farms Ditch which borders on the east side of the site. Though little more than a trickle the ditch is responsible for draining the area near the site. On all boundaries of the site large cotonwoods, maples and other assorted trees provide a visual screen around the site. The creek was intentionally included into the recommended area to maintain control of the large trees on the east side of the site. Future business development on this side of the site could prove unattractive if viewing the rear of the buildings. The ground cover consists of waist high grasses and weeds.

VIEWS:

The density of the trees obscure most views during late spring, summer and fall seasons. Presently the most attractive views are to the south and east. Commercial expansion could alter this to the east. The only public view onto the site is from the south.
SOILS:

Four soil types are to be found on the site: morley silt loam (MuB2), blount silt loam (0 - 2% slope BIA), pewamo silty clay loam (pe), and blount silt loam (2 - 4% slope eroded B1B2).

Blount-Pewamo-Morley soils are generally found together in Delaware County on upland areas. The Pewamo soils are in broad depressions and narrow fingerlike areas within areas of blount soils. The Morley soils occupy oval-shaped knolls at slightly higher elevations than the Blount and Pewamo soils. This group occupies about 190 square miles, or about 48% of the county.

Blount soils are somewhat poorly drained. They are mostly nearly level, but in some places they have short gentle slopes. Their surface layer is medium textured with a mottled silty clay subsoil to a depth of about 30". Blount soils are low in organic matter content and have a high moisture capacity. Permeability is slow.

Pewamo soils are deep and poorly drained. Their surface layer is moderately fine textured. Below the surface a thin strata of silt or sand 1 to 4 inches thick can be found in the subsoil. Moderately fine textured material is at a depth between 36 and 55 inches.

Morley soils are deep, well drained and gently sloping. Their surface layer is medium textured with a finely textured subsoil. It is a mixture of greyish-brown material from the original surface and a yellow-brown clayey material deposited from erosion. The subsoil measures from 20 to 40 inches in depth.
CLIMATE:

The climate of Delaware County is characterized by four well-defined seasons, by frequent changes in temperature and humidity, and by nearly ideal rainfall. Table 9 shows representative temperature and precipitation data. Table 10 shows the last freezing temperatures in spring and the first in fall.

Temperatures of 90° or higher occur on an average of 9 days during July, the warmest month of the year. Temperatures below zero occur on an average of 7 days in winter. January generally is the coldest month of the year.

Maximum precipitation generally is in spring and early in summer. The average rainfall in winter is less than 3 inches per month, and the average in spring is more than 4 inches per month. The months of April, May and June each have an average of 8 days with one-tenth inch or more of rain. The winter months and the months in the latter part of summer have an average of 5 days with this amount of rainfall. Rainfall of 1.3 inches or more in 1 hour occurs about once every 2 years; 2.1 inches in 1 hour, about every 10 years; and 2.5 inches in 1 hour, about every 25 years. Two inches of rain falls in a 6 hour period about once every 2 years, and 3.4 inches in a 6 hour period falls about once every 10 years. Droughts are infrequent in the county, and they affect farming only occasionally.

The average yearly snowfall is 21 inches. Most snow comes in January, but snow occurs as early as October and as late as May. The most snow in any one day, 14 inches was recorded November 26, 1950. The record for 1 month is 18.5 inches that fell
Relative humidity is from the 40's to the 60's. Relative humidity in the 40's is from the start of the rainy season. Relative humidity in the 60's to the 70's is from the end of the rainy season. Relative humidity in the 40's is from the start of the rainy season. Relative humidity in the 60's to the 70's is from the end of the rainy season.

### Table 9: Temperature and precipitation data

[All data from Muncie]

<table>
<thead>
<tr>
<th>Month</th>
<th>Temperature</th>
<th>Precipitation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Average daily minimum</td>
<td>Average daily maximum</td>
</tr>
<tr>
<td>January</td>
<td>37 °F</td>
<td>58 °F</td>
</tr>
<tr>
<td>February</td>
<td>40 °F</td>
<td>60 °F</td>
</tr>
<tr>
<td>March</td>
<td>49 °F</td>
<td>72 °F</td>
</tr>
<tr>
<td>April</td>
<td>62 °F</td>
<td>81 °F</td>
</tr>
<tr>
<td>May</td>
<td>74 °F</td>
<td>87 °F</td>
</tr>
<tr>
<td>June</td>
<td>83 °F</td>
<td>94 °F</td>
</tr>
<tr>
<td>July</td>
<td>86 °F</td>
<td>95 °F</td>
</tr>
<tr>
<td>August</td>
<td>85 °F</td>
<td>95 °F</td>
</tr>
<tr>
<td>September</td>
<td>79 °F</td>
<td>93 °F</td>
</tr>
<tr>
<td>October</td>
<td>68 °F</td>
<td>84 °F</td>
</tr>
<tr>
<td>November</td>
<td>51 °F</td>
<td>71 °F</td>
</tr>
<tr>
<td>December</td>
<td>39 °F</td>
<td>60 °F</td>
</tr>
</tbody>
</table>

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1 One inch or more.
2 Average annual highest minimum.
3 Average annual lowest minimum.
GENERAL SITE PLANNING CONSIDERATIONS:

1. Client parking should be as closely related as possible to entrance and exit areas. Where feasible, steps should be avoided, depressed curb layout provide for carts and wheelchairs.

2. Egress from public roads and highways should be safe and must be developed in accordance with the specifications of the Highway Department having jurisdiction.

3. Landscaping of areas adjoining sidewalks which will be used by clients and animals should be inanimate: colored gravel, boulders or sculpture. Dogs should be enticed to urinate in some area other than on a corner of the building at the entrance. Landscaping in other areas can be more relaxed but should be carefully designed to require little maintenance.

4. It is desirable that the client parking area be in such a location that it can be observed from the Business Office.

5. Parking areas and walks should be adequately illuminated in insure a safe travel to and from the hospital.

6. A private parking area for staff and veterinarians is a must. Parking for the doctors should be out of view, if possible. A Private hospital entrance should also be available for staff and doctors.

7. Proper identification by means of sign must be planned within the zoning ordinance and the sites requirements.
A. Building Cost
   28,000 x $40. square foot = $1,120,000.

B. Fixed Equipment
   20% x A = $224,000.

C. Site Development
   10% x A = $112,000.

D. Total Construction
   A + B + C + D = $1,456,000.

E. Site
   = $100,000.

F. Movable Equipment
   10% x A = $112,000.

G. Professional Fees
   7% x D = $101,920.

H. Contingencies
   10% x D = $146,500.

I. Administrative Cost
   1% x D = $14,560.

J. D + E + F + G + H + I
   = $1,930,980.

Revised equipment cost
   = $100,000.
   $1,830,980.
BUILDING TYPES
GENERAL INFORMATION

Hospital: New Haven Central Hospital for Veterinary Medicine
843 State Street
New Haven, Conn.
06510

Owners: see page 22

Employees: 9 full time
7 part time

Practice: 100 percent small animal

Architect: Vincent C. Amore
65 Elm Street
West Haven, Conn.

Cost: Site: $16,200
Construction: $375,000
Equipment: $60,000

Sq. Ft. Cost: $43.60

Cages: 80

Runs: 12

Parking: 17
GENERAL INFORMATION

Hospital: Equine Clinic and Surgery
2045 Grubbs Mill Road
Berwyn, Pa. 19312

Owner: Margaret Phyllis Lose, DVM

Other DVMs: Elaine J. Hopkins, DVM

Practice: 100 percent equine

Architect: Tobiessen-Wenger and Assoc.
42 East Lancaster Ave.
Paoli, Pa.

Employees: 3 full time
8 part time

Cost:
Site: $100,000
Construction: $450,000
Equipment: $150,000

Lot Size: 10 acres

Footage:
16,400 sq. ft. in main building
3,200 sq. ft. in overflow ward

Stalls: 15 in main ward
8 in overflow ward

Parking: 6 employee
6 client
GENERAL INFORMATION

Hospital: Boulder Veterinary Hospital
3630 Broadway
Boulder, Colo. 80302

Owners: Boulder Veterinary Company
(DVMs: Donald J. Craig, Joe D. Green, Paul L. Huff, L.R. Metzger and David L. Varra.)

Other DVMs: None

Employees: 4 full time
1 part time

Practice: 50% small animal

Architect: Hobert Wagener & Assoc.
Boulder, Colo.

Cost:
Site: $63,100
Construction: $156,235
Equipment: $55,000

Floor Space: 5,600

Cages: 57

Runs: 8 (indoor)

Parking: 11 public; 10 employee
GENERAL INFORMATION

Hospital: Chester Veterinary Clinic
264 Middexes Turnpike
Chester, Connecticut 06412

Owner: Orville L. Burr, DVM

Other DVMs: Charles H. Baldwin, Jr.

Practice: 25 percent large animal
75 percent small animal

Architect: Augustus Kellogg
Environmental Design Group
11 Howe St.
New Haven, Conn. 06511

Employees: 3 full time-3 part time

Cost: Site: $20,000
Construction: $180,000
Equipment: $40,000

Footage: 6860 sq. ft.


Runs: 10 indoor-1 outdoor

Cages: 50

Parking: 14 client-6 employee
BIBLIOGRAPHY

"A Combination Hospital in a Modern Residential Area" Veterinary Economics July 1974, p.56.

"Alike ... but Different" Veterinary Economics. June 1972, p.27.


"Country Economy in the City Limits" Veterinary Economics. September 1977, p.54.

"Designed Exclusively for an Equine Practice" Veterinary Economics. Dec. 1975 p. 34.

Hospital of the Year - Special Issue Veterinary Economics. May 1976.

Mann, Warren C., A.I.A. The Planning of Veterinary Hospital Facilities.

"New Haven's Central Hospital" Special Issue Veterinary Economics. Sept. 1976.