

matt bachardy building design

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RANCH HOUSE 1 – West of Austin, Texas

My clients have owned this 300 acre ranch west of Austin, Texas since the mid 1980's. Since then, they have invested an enormous effort to restore the overgrazed land with severe erosion problems in places to it's natural grassland state of 100 years ago. For example, rather than burn the cedar that is cleared to allow the native grasses to reestablish itself, the cedar is chipped into mulch instead. They also run a small organic vegetable and fruit farm on another part of the ranch.

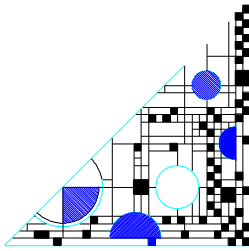
Their desire to be good stewards of the land led to the desire to build a house at the highest point on the ranch that would look and feel like it grew from the site naturally. The program for the house was fairly straightforward. Take in the tremendous long-range view, blend into the very exposed site, provide strong protection from the elements while maintaining connection to the site in an intimate and larger sense. The buildings needed to be low maintenance, structurally strong to withstand high winds, energy and resource efficient, not enormous in size and above all, comfortable and unassuming.

The clients had no preconceived idea on how the complex should look or be arranged other than a basic room count and that it incorporate the latest appropriate technology in design and construction - without going overboard with the mechanical technology. This is where design strategy comes into play, working with the site and structure to build fixed, solid elements that will function naturally and never need repair.

The combination of regionally appropriate materials, cutting edge, environmentally friendly design and construction methods with traditional design elements historically used in the region create a Modern Traditional Ranch House that will last and be enjoyed by many generations to come.



The site before construction.



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RANCH HOUSE 1 - PROJECT PROFILE



approach from the south parking area



the trellis above will eventually be covered in deciduous flowering vines



arbor walkway to the main entrance



view of glass office from the south



waterfall courtyard panorama view from the great room



west side detail views



north terrace looking east



north terrace looking west



breezeway between house and carport

GENERAL DATA:

LOCATION: 320-ACRE PRIVATE RANCH IN THE HILL COUNTRY WEST OF AUSTIN, TEXAS

TOTAL PROJECT AREA: 5,024 SQ. FT.
HEATED AREA: 2,500 SQ. FT.

3 Bedrooms, one used as a study all with walk-in closets.
2 full baths, one zoned for powder room use.
Glass walled office.
Great room including kitchen and dining.
Carport with heated mechanical / storage room and screen wall.
Extensive outdoor terraces, patios, planters and walled gardens with unique waterscape feature.

SITE PLANNING:

Permanent concrete benchmarks were set in the ground around the building site using GPS survey equipment. These benchmarks were used to align the building along an exact east-west solar orientation for the site's location. The benchmarks also provided exact elevation control with the project's numerous level changes in relation to the site's existing grade characteristics.

DESIGN FEATURES:

The site's attributes determined the floor plan layout. Long distance sight lines to the east, north and west assure a dramatic view from all of the major rooms. Prevailing southeast breezes washing over the point from a deep valley to the east, as well as the site's elevation assure access to cooling breezes even in the dog days of summer. The hilltop is called "Windy Hill" for a reason. The plan organization is designed to not only take in the views, but also to gather up the breezes and ventilate the structure naturally.

Insulated concrete walls and steel superstructure provide sheer structural strength to withstand the 80 mph wind gusts the site periodically experiences, in addition to their energy efficiency attributes.

Designed for low to zero maintenance: Exterior materials consist of concrete, native limestone, galvalume coated steel and glass – no painted surfaces except for a small amount of exposed structural steel beams most of which are protected from the weather. Interior finishes consist of stained concrete floors, clear coated pine trim, door and ceilings, low VOC painted drywall, tile in baths, granite counter tops in kitchen.

Exterior doors & windows: Eagle aluminum clad awning, casement and fixed windows; clad slider and swinging doors.

Skylights: Velux remote controlled, operable roof windows.

Careful consideration was given to the placement of all windows and skylights to promote natural ventilation of the house.

STRUCTURAL COMPONENTS:

Foundation: Monolithic concrete slab-on-grade.
Exterior walls: 6" core ICE Block insulated concrete forms.
Interior walls: Light gauge steel studs.
Ceiling insulating panels: Thermasteel light gauge steel reinforced EPS foam panels.
Structural beams: Wide flange steel beams.
Roof structure: 2x4 & 2x6 wood framing providing ventilated space above Thermasteel panels.
Roof decking: 5/8" plywood radiant barrier roof decking.

MECHANICAL SYSTEMS:

Combining high mass, high "R" construction with the promotion of natural ventilation results in a building that requires much less mechanical climate control when compared to standard construction. However, when this type of building is being mechanically heated or cooled in extreme conditions, ventilation must be provided to prevent humidity, mold and other indoor air pollution problems. A computer energy analysis determined the exact sizing of the HVAC system and will result in utility bills 1/3 less than standard construction.

Air Conditioning system: (2) zone Carrier 2 speed Puron 14.0 SEER rated a/c systems with thermostats. The system runs on low speed most of the time, but will increase capacity when occupant load increases. Ventilation system: Lifebreath ERV system with independent ductwork and controls ensure a steady fresh air exchange when the building is being heated or cooled, while minimizing energy loss at the same time.

Hot water and space heating system: 94% efficient gas water heater provides domestic hot water in addition to hot water circulated to heat exchange coils at the air handlers for space heating. This allows one piece of equipment to do two jobs and also keeps the combustion process out of the air stream, unlike a gas furnace. This system provides the benefit of high efficiency heating that does not dry out the indoor air in the winter and eliminates the possibility of a carbon monoxide problem in the future.

WATER SYSTEM:



Water supply and wastewater disposal are critical issues in this part of Texas. The owner's are committed to conservation in resources, energy and water.

Water Supply: Rainwater is collected from all of the roof area of the building. The collected water is piped from around the complex to a lift station in the ground on the north side of the house. The 4,000-gallon lift station features a roof washing capability to reject the first dirty flush of water from the roof. It also has enough intermittent storage capacity to receive and hold periodic bursts of rainfall to allow the transfer pump to operate at its rated capacity without losing water to overflow. The transfer pump moves the collected water through a sand filter, then uphill approximately 1,500 feet away to a 97,000-gallon cistern. The stored water is pressurized and sanitized at the house for domestic use. The cistern also serves the organic vegetable farm's 40,000-gallon concrete cistern on the east side of the ranch.

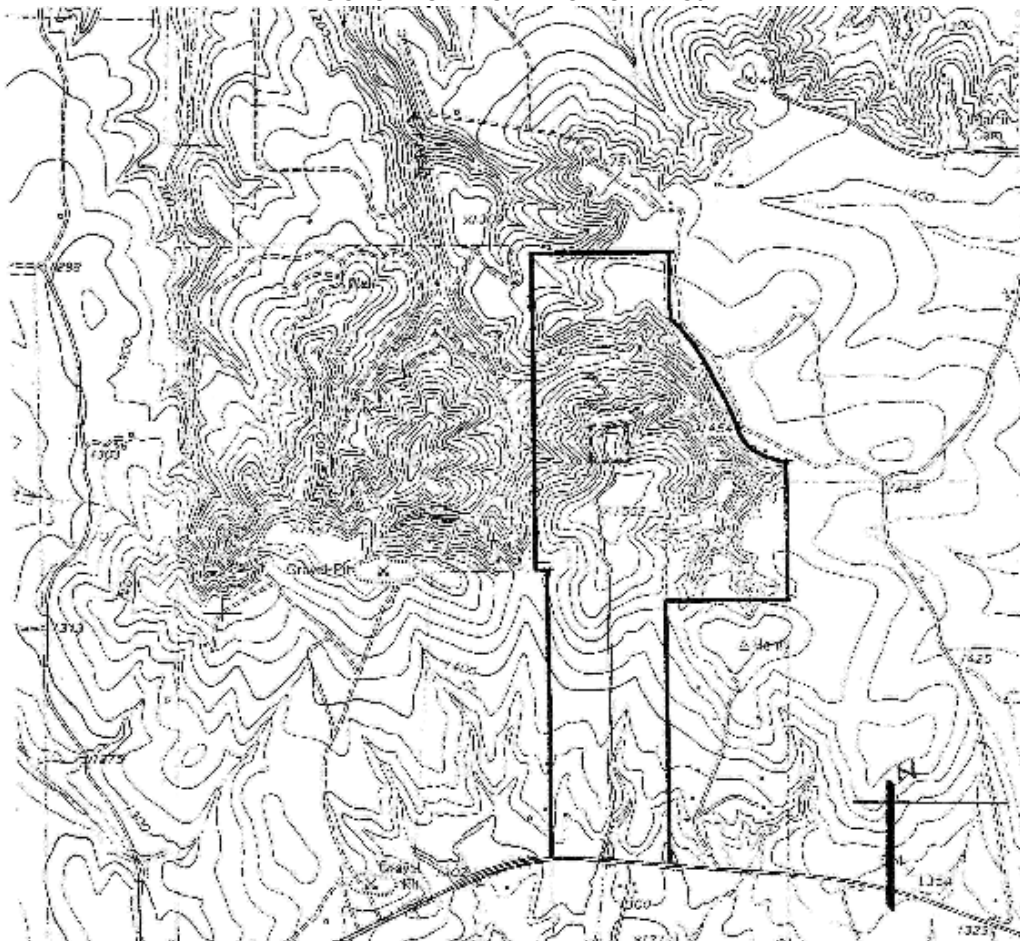
The existing water well is used to flush the toilets to minimize rainwater use, and for irrigation for the courtyards and waterscape. The well also provides a back up to the indoor water supply if necessary.

Septic System: An aerobic spray septic system treats the wastewater to a very high quality level. The effluent is dispersed through an irrigation system to keep the trees above the house well irrigated.

SITE VIEWS



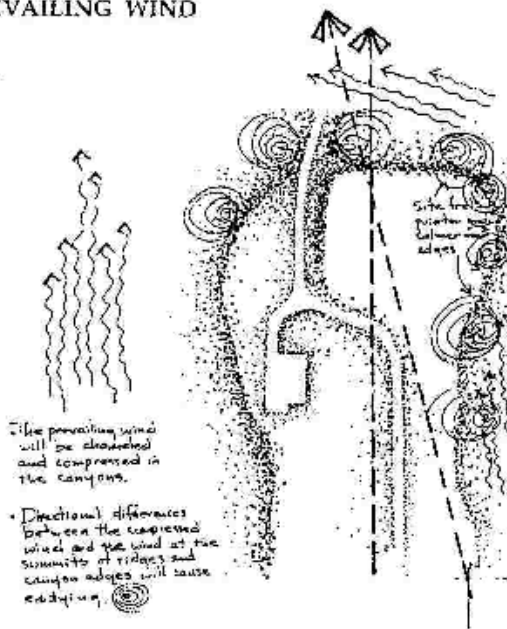
aerial view from the northwest



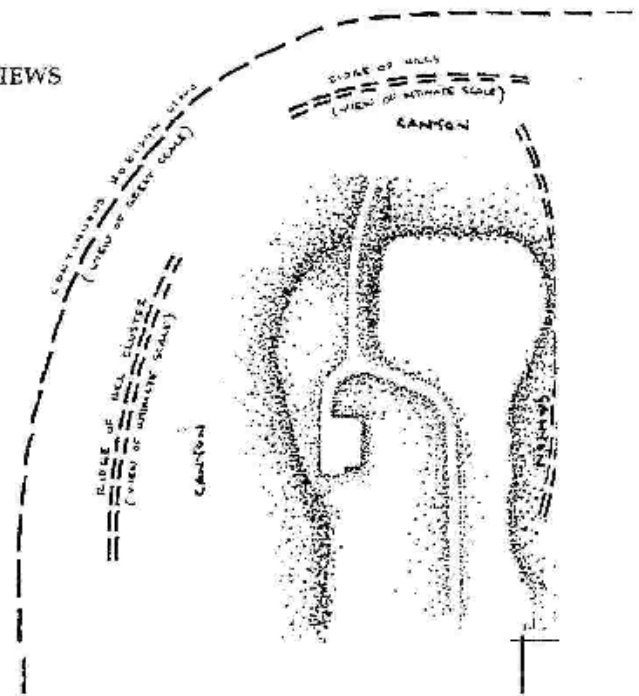
topographic site map

SITE ANALYSIS

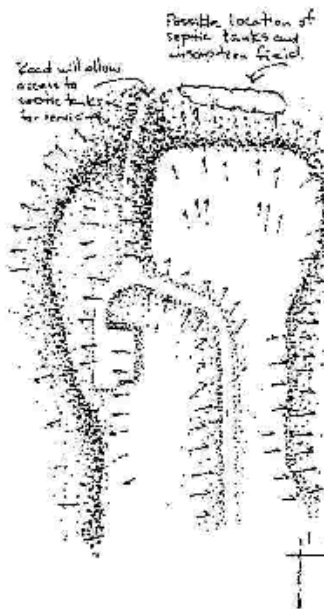
PREVAILING WIND



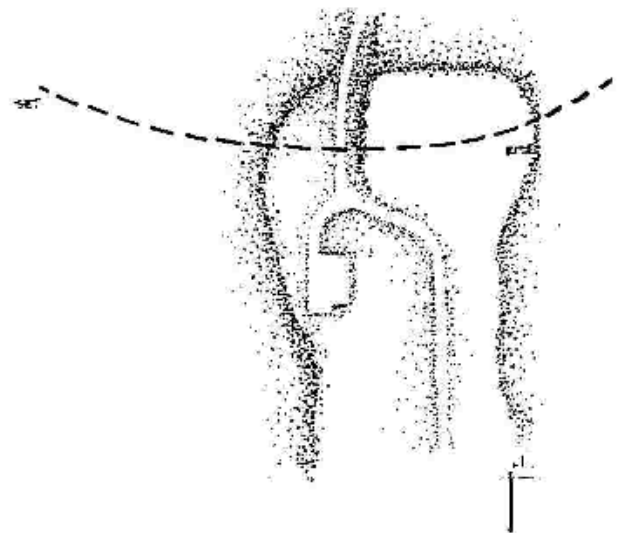
VIEWS

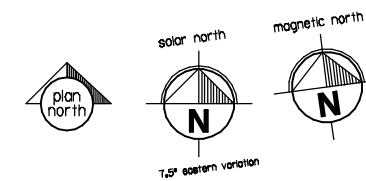
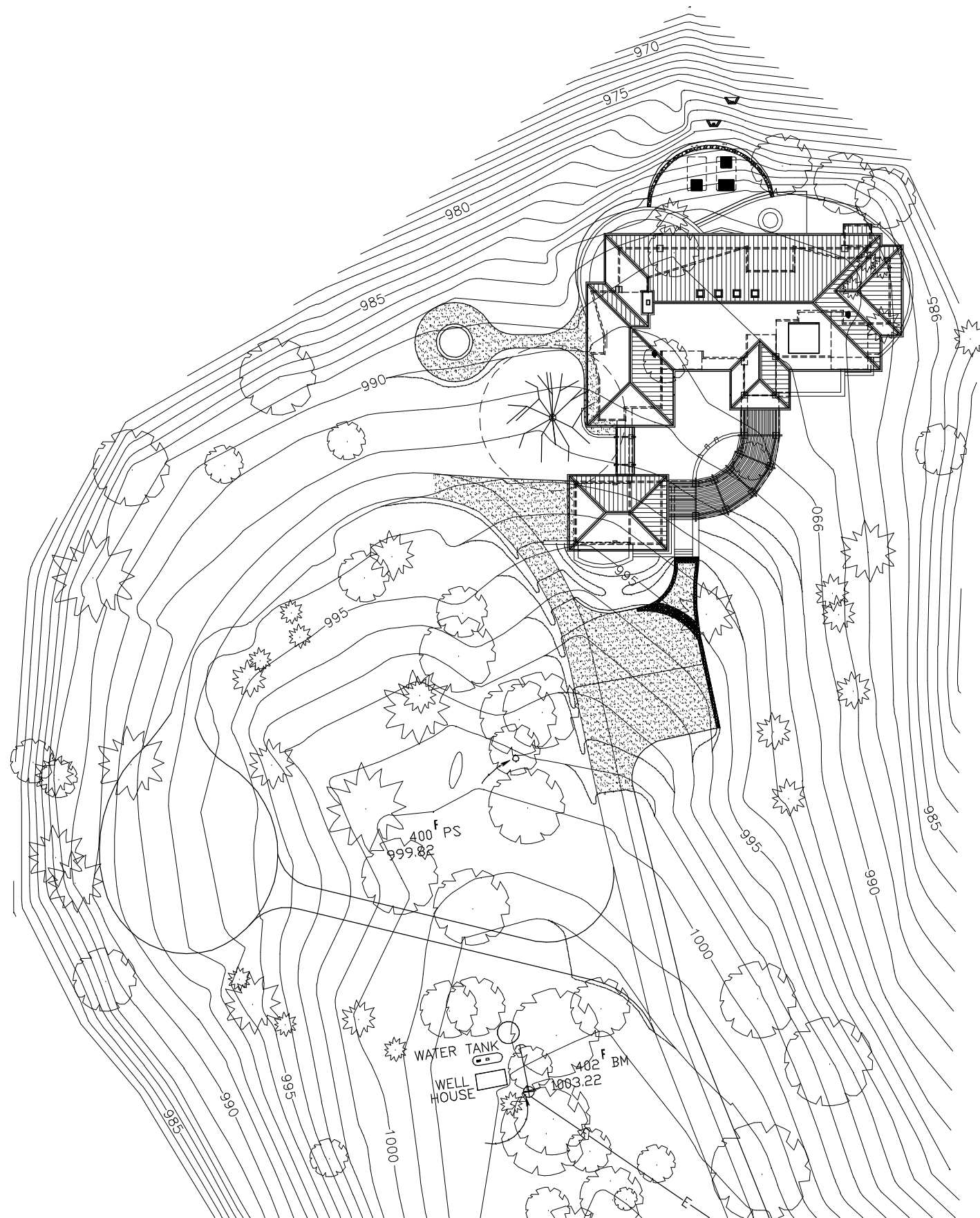


DRAINAGE PATTERN

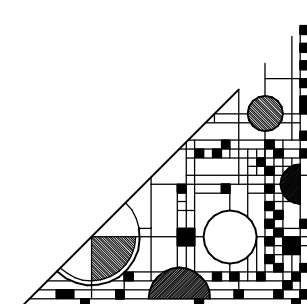


PATH OF THE SUN



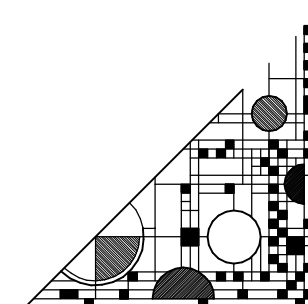
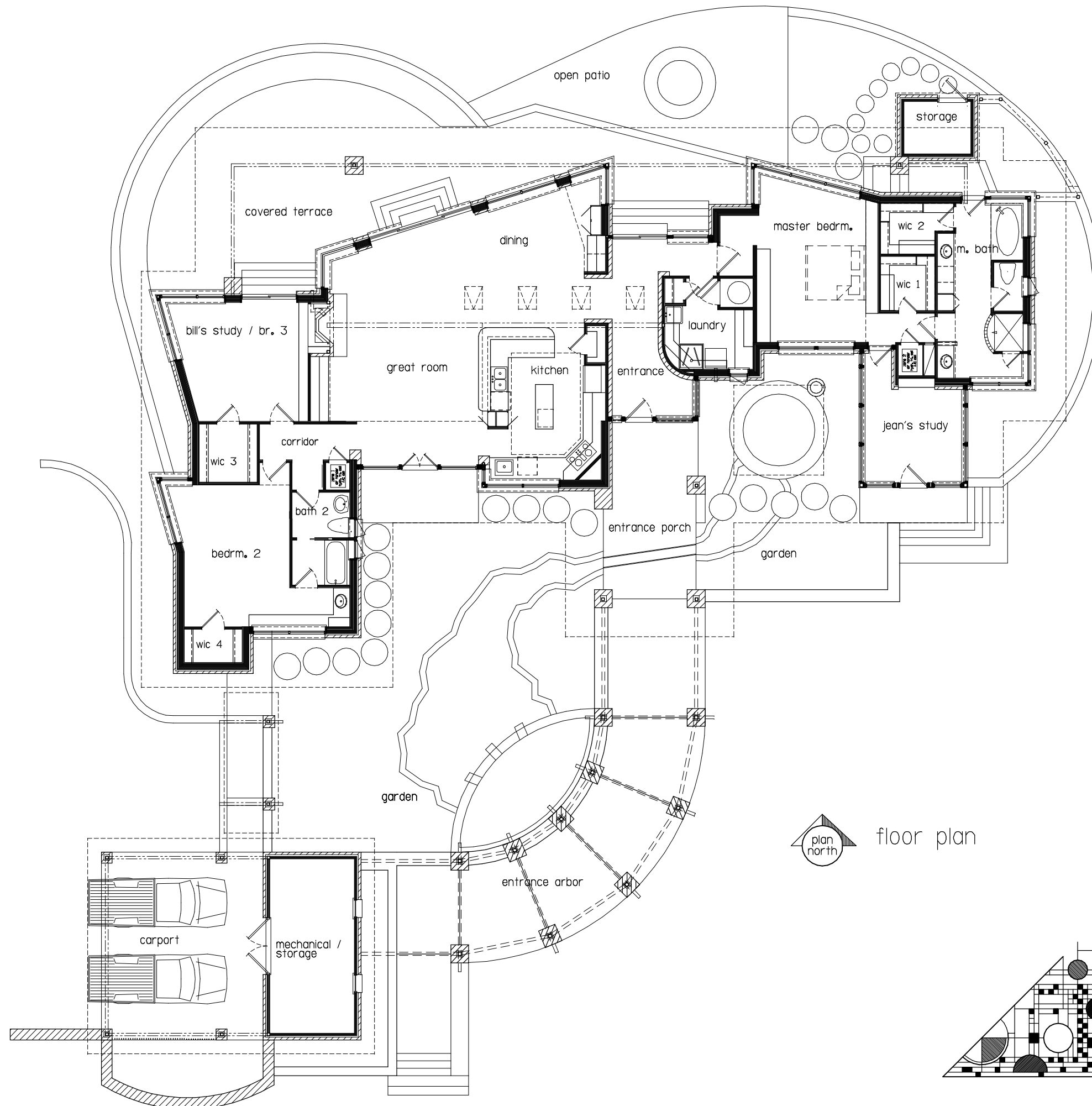


site plan



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great room looking west



great room looking east toward entry



great room looking east to kitchen / dining