THE ROFFEY - DANTO RESIDENCE

1871 Indian Trails
Bloomfield Hills, Michigan

The following is a brief synopsis of just some of the features that have been incorporated into this house in order for it to attain the highest level for LEED Certification "Platinum". The "Owners" worked very closely with the "Project Team" in all areas of the house construction which was of great assistance and benefit to the Team from the inception of construction to the conclusion. The benefit and the understanding to the "Owners", Trades and Municipality of the LEED process was invaluable especially understanding what sustainability and energy conservation is all about.

INTEGRATED PROJECT PLANNING

1.1 Preliminary Rating

A very clear objective was made by the Client during the interviewing of Architects for the Project to design a home that demonstrated the highest level of sustainable Architecture and building performance in accordance with the USGBC LEED for Homes, yet deliver a functional floor plan and presentation of form that was beautiful.

1.2 Integrated Project Team

The Architect, Interior Designer, Landscape Architect and General Contractor were selected and were informed at the onset of the client's goals for a sustainable program. All future Project Team Members (Geotechnical Engineer, MEP Engineers, Lighting Consultant Etc.) were advised of the goal to achieve the highest LEED rating in the requests for proposal solicited.

1.3 Professional LEED Credentialed

Jim Newman (LEED AP) and Carl Di Giacomo (Green Rater) of Newman Consulting Group were retained by the Client during the early Programming Phase of the Project. Jim and Carl's involvement in each phase was invaluable – from the initial considerations of demolishing the former building and salvaging materials to the completion of the working drawings and specifications and throughout the entire construction process and formal application to the USGBC.

1.4 Design Charette

All design and programming meetings throughout the Project encouraged sustainable solutions to achieving the Client's goals for the design, material selections/alternates and construction techniques implemented by the team.

1.5 Building Orientation for Solar Design

The property selected offers exceptional Southern exposure, bringing an abundance of natural daylight into the residence. Large overhangs with lightly colored soffits reflect daylight into the residence. Electronically controlled shades drop to diminish the heat

gain on the residence during the summer months. The orientation and slope of the hip roof design proved excellent for the PV solar panel orientation and the system designed to achieves the current DTE maximum net metering threshold of 20,000KW annually.

DURABILITY MANAGEMENT PROCESS

2.1 Durability Planning

The Client's desire to construct a building of low-maintenance materials was conveyed at the onset of the Project. The exterior surfaces selected for the Project are Cement Plaster, Dolomitic Limestone, Prefinished Aluminum (windows), Copper(Roof) and Stainless Steel (Guardrails) and Cement Plaster with an elastomeric finish (STO System). There is no exposed wood on any exterior surfaces and all metals are prefinished factory Kynar coated.

2.2 Durability Management

The Life Cycle Analysis (LCA) of all building products was considered and played a major role in the development of the Site and Building Systems. All subcontractors working on the Project were encouraged to offer their suggestions on increasing the quality of overall Project. The exterior building materials consist of few low maintenance materials - stone, cement plaster, metal and glass. These materials, aside from seasonal cleaning, should never require refinishing and will patina gracefully as the building ages.

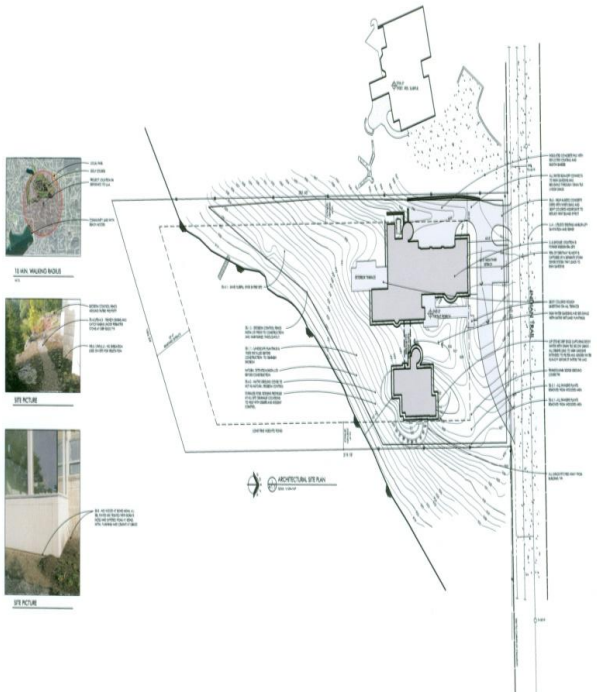
2.3 Third Party Durability Management Verification

Newman Consulting Group and the Architect performed extensive on-site pre and post construction site visits to ensure the built product conformed with the specifications program requirements for the Project. In addition, the Architect and Project Team Leader were contracted to perform weekly site visits to ensure the work conformed with the Contract Documents and Project Specifications.

LOCATION AND LINKAGES

2.2 Site Selection

The Site is located in a suburban area previously developed for a single-family residences. The property provides exceptional southern exposure, natural contours and natural, wooded surroundings and existing municipal infrastructure (gas, sanitary sewer and water).



3.3 Previously Developed

The former building, which required significant structural reworking and upgrades, was selectively demolished and all useable and/or saleable building products were removed. All products that could be repurposed was saved and the balance of

materials were properly recycled.

6.6 Access to Open Space

A natural easement is located on the property directly adjacent to the building site permitting the subdivision association member access to a woodland preserve and small, spring fed lake that is ideal for canoeing, kayaking and quiet enjoyment. The Site is also within walking distance to a local Golf/Tennis/Swim Club and community park, Wabeek Park. In addition to these amenities, the subdivision community also has privileges to an all-sports inland lake, Walnut Lake, which is less than ½ mile away.

SUSTAINABLE SITES

The project property has frontage on a small lake and the preservation of many natural features, contours, swales and protection of the water's edge were considered before the onset of construction. A MDEQ permit was obtained so water from the lake could be incorporated into the stream water feature, filtered through a series of rain gardens and then returned back into the lake with the purpose of increasing water quality of the lake and efficiently utilizing water consumption in the landscape. Signs were also posted near the stream water feature and other strategic areas advising trades and other visitors to be respectful where they washed and discarded potentially harmful chemicals or debris in an effort to protect the eco-system in the construction phase.

1.1 Erosion Controls During Construction

A 24" synthetic fabric erosion control fence was installed at the onset of the Project and was maintained throughout. In addition to the silt fencing, careful consideration was given to erosion control and bank stabilization along the lakeside was achieved by reconstituting large stones excavated. Construction erosion controls on this project were implemented and monitored through the Oakland County Drain Commission with the installation of 24" silt fencing. Great care was taken upon completion of the foundation work to control water runoff and stabilize steep slopes leading up to the lake edge through the construction of rain gardens, swales, and distribution of mulch and installation of trees and plantings throughout the construction process.

1.2 Minimize Disturbed Areas of the Site

The construction affected a majority of the Site due to the tight physical constraints and steep slope in the direct vicinity of the building. Once the foundation work was completed and the need for large construction equipment access no longer an issue, the stabilization of the lakeside slope began to control water runoff. Large rocks sourced from the basement excavation and a local quarry were placed in a sensitive, organic manner to retain the site soils in conjunction with mulch, swales and the rain gardens leading up to the water's edge.

2.1 No Invasive Plants

All existing invasive species of plants have been removed from the Site and surrounding upland areas. A member of the Six Rivers Regional Land Conversancy was retained for the evaluation of the Site and went through the wetland and lakeshore areas and also removed invasive wetland plantings. The Client's are members (President & Trustee) of a regional Land Conservancy, Six Rivers, and with the help of the volunteers, cleared the surrounding wooded property of invasive plant species and trees. New, indigenous trees and vegetation were installed to stabilize the areas and promote the growth of fauna in the proximity of the residence prior to the commencement of construction and throughout the process.

2.2 Basic Landscape Design

The Landscape Architect, Jeffrey Hennig of Environmental Artists, was retained early on and began the development of the design and installation prior to the commencement of construction. Very through documentation of the Site grading, drainage – both above and below grade, plantings and soils retention exist and were present to assist the Construction Manager during the project. The Landscape Architect also contracted the installation of all hard and softscapes to ensure the plantings and retaining materials were installed according to the plans.

2.3 Limit Conventional Turf

There is no turf present of the Project Site. Pennsylvania sedge was predominantly used as common ground cover throughout the site, replacing conventional, higher-maintenance turf/lawns, which require mowing, fertilizers and chemicals to thrive. This plant is drought tolerant, deer – resistant and its seeds are a food source for birds. Once the sedge has established itself, irrigation will not be required, eliminating the need to irrigate from municipal sources, or pumping water from the lake.

2.4 Drought Tolerant Plants

All species selected for the project are drought tolerant and once established, will require no supplemental irrigation other than natural rainfall.

a) Five different types of native evergreen trees make up the thirty trees replaced throughout the Site.
b) Swamp Oak, Serviceberry and Witch Hazel are just some of the eighteen native deciduous and ornamental trees planted throughout the Site.
c) Native sedge and groundcovers were used extensively throughout the site to minimize open exposed dirt.
d) Native wetland plantings were planted in rain gardens and along the water feature.
e) The site was reviewed at project inception, and after a thorough review, all trees that were quality in nature were successfully saved.

3.1 Concealed Generator / Live Roof System

The requirement for an automatic emergency generator was determined in the early stages of the Project. Due to Site limitations and very stringent decibel requirements of the local Municipality, there remained few options for its location. A creative and practical solution was accomplished by locating the generator below grade in a recessed alcove. The generator roof is comprised of a composite grating with a "Live Roof" vegetative decking of native drought tolerant plantings. The combined below grade condition coupled with the landscaped roof achieve superior aesthetics with dramatically reduced sound ratings while the generator is in use, or during its weekly maintenance cycle.

3.3 Reduce Local Heat Island Effect

All flat roof areas are clad with a white EPDM membrane for its high Solar Reflective Index (SRI). All building terraces and walkways have off-white limestone pavers and the driveway is lightly colored exposed aggregate concrete, chosen for both its durability and high-reflectivity.

4.1 Permeable Lot

A soils investigation was performed by a Geotechnical Engineer to determine the subsoil condition for both drainage and structural considerations. Due to the fact that the region has a high level of clay subsoil, addressing the surface water management was of high importance. The following measures were taken to address the conditions:

a. Existing clay soils were blended with locally imported topsoil for maximum water retention.
b. All planting beds were tilled and blended a minimum of 12 – 18 inches in depth to reduce soil compaction.

c. Natural double shredded hardwood mulch was used on the entire site to retain moisture in soil and reduce weed growth.
d. Organic compounds were used instead of fertilizers. Soil was amended with beneficial bacteria and mycorihza to benefit plantings.

4.2 Permanent Erosion Controls

4.3 Management of run off from roof (and driveway)

a. In addition to construction measures, slopes were permanently stabilized with native colonizing plants and mulch.
b. All roof water is captured in an open perimeter 24" wide stone drip-edge drain/ground gutter that leads to a 6" perforated drain tile below grade.
c. All drains lead to a series of tiered rain gardens planted with native wetland plants to filter and absorb water run-off before it enters the lake. The chemical reaction of rainfall on the copper roof has proven to significantly diminish the algae in the lake and is being monitored by the Land Conservancy for consideration for future projects.
d. 90 % of the driveway runoff is captured by a separate storm sewer system that also leads to rain gardens and the site water feature.

5.1 Non-Toxic Pest Control

The issue of pest control for the residence was addressed during the framing by using Borate – treated sill plates in conjunction with exterior materials that impervious to pests (cement plaster, metal flashings and masonry), with no wood whatsoever in contact with grade. To further address the incidence of pests, the bond beam was foamed with 2lb polyurethane foam, all door and window openings were flashed and counterflashed, and all plant materials are kept away from contact with the building.

6.0 Compact Development

Compact Development is not applicable to this residence and its program.

WATER EFFICIENCY

1.1 Rainwater Harvesting System

All roof water is captured in an open perimeter 24" wide stone drip-edge drain/ground gutter that leads to a 6" perforated drain tile below grade. All drains lead to a series of tiered rain gardens planted with native wetland plants to filter and absorb water run-off before it enters the lake. 90 % of the driveway runoff is captured by a separate storm sewer system that also leads to rain gardens and the site water feature.

1.2 Graywater Reuse

Two graywater recycling systems are installed to provide 66 gallons each of reclaimed domestic water for reuse. These systems manufactured by BRAC are self-contained units with integral, switched pressure pumps, make-up systems, have programmable electronic chlorination systems and their own filters.

2.1 High Efficiency Irrigation System

2.3 Reduce Irrigation Demand by at least 45%

The Irrigation system was designed for overall reduced demand and the system includes head to head coverage, a central shut off valve, multiple zones customized around specific

plantings and landforms, and an irrigation clock that allows for controlled overall reduction in water use. The irrigation system is fed from city water and is not pumped out of the lake.

a. Mist heads were used for direct directional watering.
b. Rain sensor installed for improved efficiency of water consumption.

Irrigation zones were installed (across) perpendicular to slopes, for controlled compensation of water runoff down slopes.

Due to the drought tolerant nature of the selection of materials, once the trees and plantings are established, there will be no need for artificial irrigation on the site.

3.1/3.2 High / Very High Efficient Fixtures & Fittings
All plumbing fixtures specified are low-flow fixtures

labor.

ENERGY & ATMOSPHERE

1.1 / 1.2 OPTIMIZE ENERGY PERFORMANCE

7.1 / 7.2 WATER HEATING

11.1 / 11.2 RESIDENTIAL REFRIGERANT MANAGEMENT

MATERIALS & RESOURCES

1.1 Material – Efficient Framing
The architect incorporated a repetitive four foot (4') horizontal and vertical framing module for framing layout efficiencies. This module, in conjunction with framing designs sensitive to waste which use dimensional lumber lengths and standard panel sizes wherever possible and engineered lumber (LSL & LVL's) greatly diminish construction waste and unnecessary.

1.1 FRAMING ORDER WASTE FACTOR LIMIT
Less than 10% of lumber made it to the landfill, such as, scraps used for blocking, bridging, bracing, ladders, infill, insulation backers, etc.

1.2 DETAILED FRAMING DOCUMENTS
Young & Young Supplied a dimensioned CD package.

1.3 DETAILED CUT LIST & LUMBER ORDER

1.4 FRAMING EFFICIENCIES

1.5 OFF-SITE FABRICATION
PREMANUFACTURED TRUSSES AND USE OF PRE-ENGINEERED FLOOR SYSTEMS.

2.1 / 2.2 ENVIRONMENTALLY PREFERABLE PRODUCTS

WASTE MANAGEMENT

3.1 CONSTRUCTION WASTE MANAGEMENT PLANNING

3.2 CONSTRUCTION WASTE REDUCTION

INDOOR ENVIROMENTAL QUALITY

8.1 / 8.2 / 8.3 CONTAMINANT CONTROL
No cutting within the building during HVAC operation, sealing all duct work during rough & finish, prefinished products, various mats, no smoking signs, dedicated cleaning areas for sub-trades. Post construction includes the whole house vacuum, permanent mats, etc.

9.2 RADON RESISTANT CONSTRUCTION
The vapor barrier specified for all concrete floor applications, R-Foil Hi-Tech Radiant Barrier, both inside and out, is an approved Radon barrier.

10 GARAGE POLLUTANT PROTECTION
Door mats installed in the entry to the residence at both garage locations.

PRESCRIPTIVE APPROACH FOR ENERGY AND ATMOSPHERE

2.2.2 ENHANCED INSULATION

3.3.3 MINIMAL ENVELOPE LEAKAGE

5.5.3 MINIMAL HVAC DISTRIBUTION LOSSES

6.6.3 VERY HIGH EFFICIENCY HVAC - GEO

7 WATER HEATING

7.1 EFFICIENT HOT WATER DISTRIBUTION

7.2 PIPE INSULATION

7.3 EFFICENT DOMESTIC HOT WATER EQUIPMENT

8.3 ADVANCED LIGHTING PACKAGE

9 APPLIANCES: ALL ENERGY STAR

10 RENEWABLE ENERGY THIRD SUN – PHOTOVOLTAIC SYSTEM