

DATE: \_\_\_\_\_

NAME: \_\_\_\_\_ (\_\_\_\_) \_\_\_\_-\_\_\_\_ Cell # email: \_\_\_\_\_

PROJECT LOCATION: \_\_\_\_\_

MAILING ADDRESS: \_\_\_\_\_

Dear \_\_\_\_\_

"Swimming Pool Design" will be on a retainer basis (\$\_\_\_\_\_.00). The price includes the following information which will be transposed upon our standard "Design Contract",

1. **Sheet #1**, 1/8<sup>th</sup> scaled drawing of the proposed pool area that is reflected on the Plot Plan supplied by Owner. This **L-1 Drawing will be titled "Pool Layout"** showing the diagrammatic locations for the following,

- |   |   |
|---|---|
| a.) <input type="checkbox"/> Pool Lights            | Type & Sizes  |
| b.) <input type="checkbox"/> Deck Junction Boxes    | Type & Style  |
| c.) <input type="checkbox"/> Skimmers               | Type & Style  |
| d.) <input type="checkbox"/> Main Drains            | Type & Style  |
| e.) <input type="checkbox"/> Spa Side Switch        | Type & Style  |
| f.) <input type="checkbox"/> Interior Control Panel | Type & Style  |
| g.) <input type="checkbox"/> Equipment Pad          | Size & Equipment Schematic Layout                   |
| h.) <input type="checkbox"/> Sub-Panel              | Capacity  |
| i.) <input type="checkbox"/> Control System         | Type, Style, Relay Capacity & Function Designations |
| j.) <input type="checkbox"/> GFCI Receptacles       | Per NEC Requirements                                |

2. **Sheet #2**, 1/8<sup>th</sup> scaled drawing of the proposed pool area that is reflected on the Plot Plan supplied by Owner. This **L-2 Drawing will be titled "Pool Electrical & Plumbing Layout"** showing the diagrammatic locations for the following,

- |  |   |
|--|---|
| a.) <input type="checkbox"/> 24v Electrical Conduit              | Sizes of conductors & conduits Per NEC Requirements   |
| b.) <input type="checkbox"/> 120v Electrical Conduit             | Sizes of conductors & conduits Per NEC Requirements   |
| c.) <input type="checkbox"/> Bonding Wire                        | Sizes of conductor & attachments Per NEC Requirements |
| d.) <input type="checkbox"/> NG Gas Line                         | Piping Size / IN.WC. Requirements (working pressure)  |
| e.) <input type="checkbox"/> Pool Suction Line                   | Piping Size / FPS/ GPM                                |
| f.) <input type="checkbox"/> Pool Return Line                    | Piping Size/ FPS/ GPM                                 |
| g.) <input type="checkbox"/> Lower Basin Main Drain Suction Line | Piping Size/ FPS/ GPM                                 |
| h.) <input type="checkbox"/> Lower Basin Skimmer Suction Line    | Piping Size/ FPS/ GPM                                 |
| i.) <input type="checkbox"/> Spa Hot Water Suction Line          | Piping Size/ FPS/ GPM                                 |
| j.) <input type="checkbox"/> Spa Hot Water Return Line           | Piping Size/ FPS/ GPM                                 |
| k.) <input type="checkbox"/> Spa Jet (s) Suction Line            | Piping Size/ FPS/ GPM                                 |
| l.) <input type="checkbox"/> Spa Jet Return Line                 | Piping Size/ FPS/ GPM                                 |
| m.) <input type="checkbox"/> Spa Air Line                        | Piping Size/ FPS/ GPM                                 |
| n.) <input type="checkbox"/> Ozone Generator Line                | Piping Size/ FPS/ GPM (Optional)                      |
| o.) <input type="checkbox"/> Salt / Chlorine Generator           | Type, Style, Size, Mfg./ Model # (Optional)           |
| p.) <input type="checkbox"/> Water Supply Line                   | Piping Size/ FPS/ GPM                                 |
| q.) <input type="checkbox"/> Auto-fill / Overflow line           | Piping Size/ FPS/ GPM                                 |
| r.) <input type="checkbox"/> Backflow Prevention                 | Type, Style, Mfg & Size                               |
| s.) <input type="checkbox"/> Pump (s)                            | Type, Style, Hp. Size, Mfg./ Model #                  |
| t.) <input type="checkbox"/> Air Blower (s)                      | Type, Style, Hp. Size, Mfg./ Model #                  |
| u.) <input type="checkbox"/> Heater                              | Type, Style, Size, Mfg./ Model #                      |

3. **Sheet #3**, 1/8<sup>th</sup> scaled drawing of the proposed pool area that is reflected on the Plot Plan supplied by Owner. This **L-3 Drawing will be titled "Mandated Safety Requirements Layout"** showing the diagrammatic locations for the following,

- |  |   |
|--|---|
| a.) <input type="checkbox"/> Door Alarms           | Type, Style, Hp. Size, Mfg./ Model #        |
| b.) <input type="checkbox"/> Fencing               | Height & clearances requirements            |
| c.) <input type="checkbox"/> Self Closing Gates    | Directional & height requirements           |
| d.) <input type="checkbox"/> Safety Tempered Glass | Proximity to water environment requirements |

4. **Sheet #4**, Not to Scaled "Construction Details" of the proposed pool that is reflected on the Plot Plan supplied by Owner. This **L-4 Drawing will be titled "Construction Details"** showing the diagrammatic intentions for installation for several components as follows,

- |   |   |
|---|---|
| a.) <input type="checkbox"/> Lights   | f.) <input type="checkbox"/> Fiber Optic Illuminator                  |
| b.) <input type="checkbox"/> Skimmers   | g.) <input type="checkbox"/> Raised Bond Beam Topical Applications    |
| c.) <input type="checkbox"/> Equipment Pad  | h.) <input type="checkbox"/> Spa Jets                                 |
| d.) <input type="checkbox"/> Pool Bottom, Lower Basin Bottom, Steps, Swim-outs configurations | i.) <input type="checkbox"/> Other non-engineered elements (optional) |

5. **Sheet #5**, Non-scaled "Construction Specifications" of the proposed pool that is reflected on the Plot Plan supplied by Owner. This **L-5 Drawing will be titled "Construction Specification"** describing the finer intentions for installation as follows,

- |  |   |
|--|---|
| a.) <input type="checkbox"/> Concrete Flatwork | (Load Design, Ready Mix Supply / Delivery Timeframes, Crew Strengths & Production Capacities)       |
| b.) <input type="checkbox"/> Plumbing System   | (Hydraulics / Flow Rates, Trenching & Piping Placements, Mfg. Recommendations)                      |
| c.) <input type="checkbox"/> Drainage Network  | (Historical In flow Precipitation Rates, Surface Flow Calculations, Open Grate Space, Piping Sizes) |
| d.) <input type="checkbox"/> Electrical System | (Operational Load Calculations, NEC, AVL %, Conduit Installation)                                   |

6. **Sheet #6**, Non-scaled "Standard Steel Reinforcement Schedule" of the proposed pool that is reflected on the Plot Plan supplied by Owner. This **L-6 drawing will be titled "Standard Steel Reinforcement Schedule"** (SSRS) describing the finer intentions for the structural reinforcement. A "WET STAMP" copy will be supplied (produced by Neil Anderson & Associates Inc.) and will be inclusive of a Standard Steel Reinforcement "Boiler Plate" set of steel erecting details.

7. **Sheet #7**, Itemized **8.5" x 11.0" Proposal and "Billing of Quantities" (BOQ)** reflecting a quantification of the accumulative assembly of construction elements. This framework provides a defined qualification for the total requirements, thus allowing comparative analyses to be performed during the bidding process. This tool establishes a basis for real measurements to be derive among any selected contenders and provides a more comprehensive result which in turn affords the Owner with much greater clarity for what is included and or excluded.

### **EXCLUSIONS OF SERVICES;**

- |   |   |
|---|---|
| • Geotechnical Engineering                        | Seismic Influences Analysis                         |
| • Soils Testing                                   | Site Suitability Assessments / Studies              |
| • Structural Engineering (beyond Sheet L-6 (SSS)) | Specialty Electrical Engineering (beyond Sheet L-2) |
| • Surface Drainage analysis                       | Hydro-static Drainage analysis                      |
| • Safety CA-OSHA Guidelines                       | Any extended service beyond those described herein  |

If you wish to bid the job out we will can provide (3) three copies of completed drawings for that purpose.

In today's swimming pool building environment, sales presentations usually don't commit a level of full accountability for construction practices and standards that can provide homeowners with real measurable differences. Real differences in swimming pool construction exist and it is these obscure differences that often get lost in an arena of price grinding and sales hype. The following are just a few elements of swimming pool construction that can provide a cheaper pool that will end up costing you much more in the long run:

- Longer turnover durations (Cycle turns of 6-10 hours per day)
- Averaging or guessing at the hydraulic requirements
- Oversize pumping and undersized plumbing systems (High Electrical Consumption)
- Over filtration (D.E. & Cartage replacement costs)
- Undersized wire for total operational conditions (Voltage loss = lost KW)
- Inadequate suction to return ratio (Skimmers & Returns Surface Circulation)
- Inflexible control system
- Long run time of parasitic solar operations

These elements and others are not generally defined by swimming pool builder's plans nor are they identifiable requirements within the Uniform Building Code (UBC) standards. In building **production style swimming pools**, the obligation of expressing greater definition on plans should be the responsibility of your salesperson. These responsibilities should encompass spending enough orientation time in which to weave the desires of an individual client's requirements through the process of an elevated understanding for the possibilities. An individual approach generally conflicts with a "cookie cutter" approach to production sales. Cookie cutters are designed to streamline sales and production while squeezing your pool into their framework.

Production sales approaches often capture greater market share on the perception of a lower price. The reality is that the price you are getting will include a five to ten percent sales commission for the salesperson plus as much as fifteen percent minimum profit margin required by the production builder. This can consume as much **25% of your pool-building budget** before you ever get started!!!

This scenario often forces the production builder to solicit pricing from an array of sub-contractors competing for pieces of your project. In such an environment, each sub-contractor must be low bidder in order to secure the work. Therefore, he/she certainly can't make you the beneficiary of a more sophisticated approach when lowest pricing defines the "limits of intentions" rather than the "potential for capability".

It is your choice to benefit from a fully anticipated approach to the construction of your swimming pool or hope someone can fulfill an undefined commitment with 75% of your pool budget. It is your obligation to discover where your dollars are being applied and your responsibility to hold your salesperson accountable. Our clients are required to be involved and therefore as consumers they will need to take a little more time to become familiar with the choices and consequences of those decisions. If we are to meet your expectations then, those expectations will require identification.

A pool design starts with shape and should continue with the other very important layers of designing that represent the requirements for delegating the intricacies to the many tradespersons that will be involved. A one page drawing can't possible convey a meaningful approach to;

- L-1 Drawing will be titled "Pool Layout"
- L-2 Drawing will be titled "Pool Electrical & Plumbing Layout"
- L-3 Drawing will be titled "Mandated Safety Requirements Layout"
- L-4 Drawing will be titled "Construction Details"
- L-5 Drawing will be titled "Construction Specification"
- L-6 drawing will be titled "Standard Steel Reinforcement Schedule"
- 8.5" x 11.0" Proposal and "Billing of Quantities" (BOQ)

We provide bench marks for **structural reinforcement engineering**, **electrical engineering load calculations**, **hydraulic engineering calculations** for pump / piping size & capacities, **elevation transitions** and a written specification in order to articulate the **true meaning** for the intended level of commitment necessary in building a quality outdoor environment. When offered a Free Plan ask yourself, who benefits from the absence of a define commitment and how much clearer will the hidden picture within the puzzle become when realizing there are missing pieces.

We would like to add that during your selection process of contractor's we realize that there is a market for both custom and production builders. We wish you to identify us, as a **Custom Builder** focused on delivering a product that is commensurable with our credentialed knowledge. We desire participation in projects like yours where these attributes have a need for application. Engineered solutions involving soil composition, reinforced concrete, drainage, irrigation, lighting, wet / dry utilities and swimming pool infrastructure doesn't cost our clients, it pays those willing to measure the differences between **hype Vs fact**. A summation of this point can be gained through the following statement,

***"Experience is what you get when you didn't get what you paid for."***

In a final note during your solicitation process and interviews of prospective swimming pool builders, you may wish to evaluate these candidates's acquired knowledge and weigh any perceived contributions of value against the possession of verifiable credentials.

### LICENSING & CERTIFICATIONS:

- GENERAL ENGINEERING #626207
- C-53 SWIMMING POOL BUILDER
- C-27 LANDSCAPE CONSTRUCTION
- CERTIFIED POOL OPERATOR (CPO)
- CERTIFIED IRRIGATION MANAGER #1112 (CIM)
- GENESIS III DESIGN GRADUATE LEVEL I & II
- JANDY CERTIFIED HEATERS & CONTROLS

### APPLICATIONS & DISCIPLINES

GEOTECHNICAL & STRUCTURAL ENGINEERING  
EXCAVATION, REINFORCEMENT, PLUMBING, ELECTRICAL  
PLANTINGS, IRRIGATION, MASONRY, CONCRETE  
WATER CHEMISTRY, HEALTH STANDARDS  
PUMPING & PIPING HYDRAULICS, ELECTRICAL ENGINEERING  
ADVANCED SWIMMING POOL NOMENCLATURES  
JANDY PRO EDGE PROGRAM CERTIFICATIONS

## MEASURING IMPORTANT DIFFERENCES

### Design is much more than just shapes

When attempting to create a "Yardstick" of measurement between pool builders realize shape is only the beginning to a well planned design concept. The obscure elements of design involving the often hidden components such as the plumbing system can have a far greater impact on the functionality and operational cost over the life of your pool.

#### QUESTIONS TO ASK;

- How many Main Drains will my pool have and what size is the plumbing?
- How many Skimmer will my pool have and what size is the plumbing?
- What is the overall distance between my pool equipment pad and the actual pool?

Note: If your pool builder can't answer these questions upon presenting a design you can assume the intentions were to be vague.

### How does more cost less?

In calculating the requirements for a swimming pool's pumping system several elements must be considered. The quantities of these "inlet" devices in combination with piping distances and piping sizes all have a restrictive value on the movement of a given desired quantity of water and this is referred to as the "negative suction lift requirement (NSL)". Essentially the impeller is designed to draw water from the inlet size and then push water out of the outlet side. The more efficient this is done according to the pump design the less electricity is used during the pumping process.

#### QUESTIONS TO ASK;

- What horsepower rating is my pump and why has that size been selected?
- How many hours per day will I need to operate my filtering system?
- What is the Kilowatt electrical consumption and designed water flow rate of my pumping system?
- What will my pool cost to operate, monthly, yearly and over it's lifetime?

Note: If your pool builder can't answer these questions upon presenting a design a crucial component of the design is missing.

### What role does the pumping system play?

The sizing of a swimming pool pump (1 hp., 1 1/2 hp, 2 hp and so on) should have a corresponding relationship with the skimmers, main drains, return lines, equipment selection and other key components of the swimming pool.

Skimmers and Main Drains are plumbed into the suction side of a pump. The suction side of the pump draws water from the pool by reducing the atmospheric pressure (14.7 P.S.I. @ sea level) inside the piping system (atmospheric pressure is the weight of earth's atmosphere on the globe). This process is attempting to create a vacuum by lowering the earth's atmospheric pressure inside the piping system and causing the water inside the pipe to become drawn to the void of atmospheric pressure created by the pump's impeller. The objective is to lower the atmospheric pressure in order to draw the water to the pump head but, not actually create a complete vacuum. If, the restrictions in the plumbing system are to great it will cause excessive "friction losses" creating a vacuum and this can result in a destructive condition called "cavitations".

#### QUESTIONS TO ASK;

- What is the negative suction lift requirement for my pool?
- What are the total friction losses through the entire filtering system, suction to return?
- What is the electrical efficiency percentage rating of my pump at the designed flow rates?

Note: If you don't get a straight answer from your pool builder on these questions, you probably won't like your future electric bills.

### Are you going to feed a bandit?

How much water can be drawn in and pushed out efficiently has several variables. The Pumping horsepower, impeller design, piping sizes and piping distances, quantities of fittings, specific equipment, elevations +/- together with the level of filtration applied and the status of clean filtering during operation all play a role. Harmonizing hydraulic balance within the plumbing system allows a determination to be gained as to pump selection not the other way around. In order to select the correct pump an understanding for the engineering principals involved must be gained, calculated and anticipated. The over consumption of electricity from an improperly designed pumping system can equate to thousands of dollars of wasted money over the life of a swimming pool. Another bandit of energy is the under sizing of the main electrical conductor, the wire run between the pool equipment sub-panel and the main electrical panel. This calculation is much like the friction losses in a plumbing system with a key note being that the voltage losses are after your electric meter so you are paying for the loss of kilowatt usage even before you have a chance to put it to good use.

#### QUESTIONS TO ASK;

- What is the percentage of voltage loss during operational function of the filtering system and the pool cleaner?
- What gauge wire has been specified and what is the distance of the entire wire run?
- What is the electrical efficiency percentage rating of my pump at the designed flow rates?

Note: If your pool builder can't answer these questions upon presenting a design, you probably won't like your future electric bills either.

## WHAT IS DESIGN

A final step to design after commitments to the shapes, elevations and special features have been concluded is to determine how the water will flow. In order to wed a pool's piping system to an equipment package, calculations should be performed that allow a true understanding to be gained for the hydraulic conditions that will prevail and that will become the marriage (good or bad) between you and your pool's thrust for power. This is the most overlooked detail associated with the greatest long-term costs to the Owner than with any other oversight in the pool industry today. Every swimming pool proposal can include a "True Design" performed by Earth Dynamics Poolscapes reflecting the accurate intentions of the infrastructure. This information is vital today if, your pool is to be build will a clear understanding for the energy efficiency demands of tomorrow!

## PLUMBING SCHEMATIC

We can provide a complete plumbing schematic with all operational hydraulic calculations performed for the entire piping network. Our CAD design format will convert piping distances, equipment restriction, fittings, elevation changes and flow rates into piping size requirements. This imagery will correspond to "Best Selection" of your pump and motor's output. Operational durations will be expressed in hours to complete a filtering cycle using the least electricity on plan and programs can be set with this information with a high degree of energy efficiency confidence.

By specifying the pipe distances, pump sizes and equipment selection directed at electrical efficiency it takes the guesswork out of the cost estimate analyses. The bidding game of smoke and mirrors are eliminated and you have a build-able plan that will provide an easily delegate-able format in which installation crews can perform per the clear and concise graphically expressed instructions.

## ELECTRICAL LAYOUT

After determining the "Best Selection" for the pump, motor and pipe sizing our design will express the most efficient power runs considering for conductors sizes, conduit networks and operational power load demands. Breakers, switching, controls, deck boxes, lights, low voltage, yard power, and all the electrical requirements necessary will be graphically expressed so they can be easily measured, accounted for and clearly presented as a requirement.

## EQUIPMENT PAD LAYOUT

Our CAD design includes a scaled "Top View" diagrammatically expressions of an equipment pad layout with all of the selected equipment positioned. This aids rough-in plumbing considerations to mirror the desired position of actual equipment in a fashion that reduces double work and reconfigurations at "equipment set". Details such as Multi-port Valves, Straight through Valves, Check Valves, Feeders, Solar Systems, Low Voltage, Flex Conduit, etc. are exhibited on plan and are easily identifiable and quantifiable. A nuts and bolts quote for the entire equipment pad can additionally be provided at "no charge" upon request!

## INSTALLATION DETAILS

Together with our CAD plumbing, electrical & equipment layouts we combine this information with a complete volume of construction details which highlight accepted industry practices, procedures and manufacturers recommendations. These accumulations of both pictorial reproductions and verbiage step by step directions leave nothing to the imagination, nothing to fall through the cracks.

## SPECIFICATIONS

We have combined the ANSI, NSPI, UBC & NEC recommendations and building code requirements to project the most detailed listing of the appropriate manufactured components that meet or exceed the specified requirements. This information is combined with each set of plans allowing an organized and anticipatable transition to take place through the building permit inspection process.

## PERMIT ASSISTANCE

If desired we can provide "permit companionship" issuing ready made plans for permit depicting jurisdictional building set backs, vicinity maps, utility easements, plot plan-property lines together with all the necessary assisted completion of the procedural documentation necessary for being issued a building permit.

## OPERATIONS & MAINTENANCE MANUAL

We have compiled from each manufacturer listed complete, O & M manuals explaining troubleshooting procedures, maintenance practices, safety tips and guidelines for trouble free operations directed at better longevity and performance within the parameters of warrantees' specifications.

Thank You,

*Michael Chaffee* CIM, CPO

Earth Dynamics Poolscapes Inc.

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SWIMMING POOL DESIGN