# REMANSO VILLA

San Juan Del Sur, Rivas, Nicaragua

## PLUMBING GENERAL NOTES

1.1 THE PLUMBING WORK SHALL CONFORM TO APPLICABLE STATE AND LOCAL CODES AND THE REQUIREMENTS OF THE AUTHORITIES HAVING JURISDICTION. ALL PLUMBING WORK SHALL BE PERFORMED BY A CONTRACTOR LICENSED IN THE JURISDICTION OF INSTALLATION. THE CONTRACTOR SHALL HAVE QUALIFICATIONS AND EXPERIENCE IN INSTALLING PLUMBING EQUIPMENT. THE CONTRACTOR SHALL FOLLOW ALL MANUFACTURER'S INSTALLATION DOCUMENTATION. NO STRUCTURAL MEMBERS OR COMPONENTS SHALL BE CUT, NOTCHED, OR OTHERWISE ALTERED FOR THE INSTALLATION OF PLUMBING EQUIPMENT.

1.2 CODES AND PERMITS: COMPLY WITH 2018 NATIONAL STANDARD PLUMBING CODE AS/NZS 3500

2. CONTRACTOR SHALL BE RESPONSIBLE FOR VISIITING THE SITE AND VERIFYING ALL EXISTING FIELD CONDITIONS PRIOR TO SUBMITTING A BID.

3. CONTRACTOR IS RESPONSIBLE FOR COORDINATING WORK WITH THE WORK OF ALL OTHER TRADES AND MAKING ANY NECESSARY MODIFICATIONS TO WORK AT NO ADDITIONAL COST, INCLUDING ALL OFFSETS.

4. ALL PERMITS. FEES. LICENSES. APPROVALS AND OTHER ARRANGEMENTS FOR WORK SHALL BE OBTAINED BY THE CONTRACTOR.

5. CONTRACTOR IS RESPONSIBLE FOR SUBMITTING SHOP DRAWINGS PRIOR TO START CONSTRUCTION FOR PERMIT AS REQUIRED. THE SHOP DRAWINGS SHALL INDICATE WORK OF OTHER TRADES AND MUST BE SUBMITTED PRIOR TO FABRICATION AND INSTALLATION FOR PERMIT AS REQUIRED.

6. PROVIDE COMPLETE OPERATING TECHNICIAN TO INSTRUCT THE OWNER IN THE OPERATION AND MAINTENANCE OF THE INSTALLED EQUIPMENT.

7. PROVIDE ACCESS PANELS FOR ALL VALVES OR ANY PIECE OF EQUIPMENT WHEN NECESSARY TO LOCATE ABOVE INACCESSIBLE CEILINGS.

ȣ. PROVIDE ALL HOLES, SLEEVES, AND CAULKING FOR INSTALLATION OF THIS WORK. CAULKING TO CONFORM TO FIRE RATING OF WALLS.

9. PIPING SHALL BE ABOVE CEILING AND CLEAR ANY EXISTING PIPING, LIGHTING FIXTURES, DUCTS, ETC.

10. RUN NEW WASTE PIPES AS CLOSE AS POSSIBLE TO UNDERSIDE OF FLOOR SLAB AND VENT PIPING AS CLOSE AS POSSIBLE TO SLAB ABOVE.

11. RUN ALL PIPING PERPENDICULAR & PARALLEL TO CLOSEST WALL OR PRIMARY STRUCTURAL ELEMENTS.

12. DISRUPTION OF ANY EXISTING SERVICE SHALL BE COORDINATED WITH THE OWNER AND SHALL BE PERFORMED AT A TIME AND MANNER SO AS TO CAUSE THE OWNER A MINIMUM OF INCONVENIENCE.

13. INSULATION: DOMESTIC HOT AND COLD-WATER PIPING SHALL BE INSULATED WITH 15MM THICK.

14. MATERIALS SHALL BE RATED FOR THE OPERATING TEMPERATURE AND PRESSURE OF THE PLUMBING SYSTEM. MATERIALS SHALL BE SUITABLE FOR THE TYPE OF FLUID IN THE PLUMBING SYSTEM.

15. PROJECT PREMISES SHALL BE THOROUGHLY CLEANED AND READY FOR OCCUPANCY INCLUDING ALL FINISHES OF EQUIPMENT PROVIDED AS PART OF THE CONTRACTOR'S WORK.

16. THE CONTRACTOR SHALL BE RESPONSIBLE FOR AND PAY FOR ANY DAMAGES RESULTING FROM OR CAUSED BY DEFECTS IN THEIR WORK.

17. PIPING SHOWN IS SCHEMATIC AND DOES NOT INDICATE EVERY OFFSET. ELBOW, UNION, VALVE, TRAP. ACCESS PANEL. ETC., THAT IS REQUIRED FOR A COMPLETE WORKING SYSTEM. PROVIDE ITEMS AND FITTINGS THAT ARE REQUIRED TO INSTALL THE PIPING SYSTEM WITHIN THE SPACE PROVIDED AND THAT ARE REQUIRED FOR A COMPLETE SYSTEM. PIPING SHALL BE PROPERLY SECURED IN ACCORDANCE WITH AS/NZS 3500 STANDARDS.

18. MATERIALS SHALL BE RATED FOR THE OPERATING TEMPERATURE AND PRESSURE OF DOMESTIC SYSTEM. MATERIALS SHALL BE SUITABLE FOR THE TYPE OF FLUID IN THE DOMESTIC SYSTEM.

19. PIPE SUPPORTS SHALL BE SELECTED AND INSTALLED IN ACCORDANCE WITH AS/NZS 3500 CODES, WHICHEVER IS MORE STRINGENT. UTILIZE TRAPEZE HANGERS FOR PARALLEL RUNS OR PIPING. OTHER THAN SPRINKLER AND WASTE PIPING. COPPER PIPING SYSTEMS SHALL BE SUPPORTED ON COPPER OR COPPER-PLATED SUPPORTS. HANG PIPE FROM SUBSTANTIAL BUILDING STRUCTURE, PIPING SHALL NOT BE HUNG FROM OTHER PIPING. ALL RIGID HANGERS SHALL PROVIDE A MEANS OF VERTICAL ADJUSTMENT AFTER ERECTION. SHIELD SHALL BE PROVIDED BETWEEN HANGERS AND INSULATION

## PLUMBING FIXTURES

20A. FURNISH AND INSTALL PLUMBING FIXTURES INDICATED. FIXTURES TO BE NEW, CONNECTED, CLEANED, AND

READY FOR USE. PIPING TO BE PROPERLY SECURED TO WALLS AND STUDS. B. PROVIDE TRAPS AND SUPPLIES WITH STOPS. MAKE ALL FINAL CONNECTIONS TO EACH FIXTURE.

21. HANGERS:

A. PIPE HANGERS ON HOT PIPING TO BE ON INSIDE OF INSULATION. PROVIDE WITH SADDLES AND/OR SHIELDS AS REQUIRED.

B. PIPE HANGERS ON COLD PIPING TO BE ON OUTSIDE OF INSULATION. PROVIDE WITH SADDLES AND/OR SHIELDS AS REQUIRED.

22. PROVIDE ANY AND ALL ITEMS NECESSARY TO COMPLETE THE PLUMBING SYSTEM. THE PLUMBING DRAWINGS ARE DIAGRAMMATIC AND DO NOT NECESSARILY SHOW ALL VALVES, FITTINGS, TRAPS, CONTROL DEVICE METHODS.

23. TOXIC MATERIALS

IN THE EVENT THE CONTRACTOR ENCOUNTERS ON THE SITE MATERIAL REASONABLY BELIEVED TO BE ASBESTOS, POLYCHLORINATED BIPHENYL (PCB) OR OTHER TOXIC MATERIAL, WHICH HAS NOT BEEN RENDERED HARMLESS, THE CONTRACTOR SHALL IMMEDIATELY STOP WORK IN THE AREA AFFECTED, SEAL OFF THE PERIMETER, AND REPORT THE CONDITION TO THE OWNER IN WRITING. NO NEW BUILDING MATERIAL SHALL CONTAIN ASBESTOS, POLYCHLORINATED BIPHENYL (PCB) OR OTHER TOXIC MATERIAL AS DEFINED BY STATE AND FEDERAL REGULATORY AGENCIES.

## LEGEND

| ABBR | DESCRIPTION | ABBR | DESCRIPTION |
|---|---|---|---|
| CW | COLD WATER PIPE | FD | FLOOR DRAIN OUTLET |
| HW | HOT WATER PIPE | VP | VENT PIPE |
| H.W.R | HOT WATER RETURN PIPE | SWP | SOIL - WASTE PIPE |
| GV | GATE VALVE | SWS | SOIL - WASTE STACK |
| | PIPE - DOWN | | |
| | PIPE - UP | WP | WASTE PIPE |
| PRV | PRESSURE REDUCING VALVE | RWP | RAIN WATER PIPE |
| FCV | FLOW CONTROL VALVE | RWS | RAIN WATER STACK |
| F/A | FROM ABOVE | PP | POLY PROPYLENE |
| F/B | FROM BELOW | UPVC | UNPLASTICIZED POLYVINYL CHLORIDE |
| T/A | TO ABOVE | RD | ROOF DRAIN |
| T/B | TO BELOW | FWG | FLOOR GULLY TRAP |
| BFS | BELOW FLOOR SLAB | F.H.C. | FIRE HOSE CABINET |
| @HL | AT HIGH LEVEL | | FIRE WATER PIPE |
| @LL | AT LOW LEVEL | M.W.P. | MUNCIPAL WATER PIPE |
| CO | CLEAN OUT PLUG | | WATER SUPPLY RISER |
| FCO | FLOOR CLEAN OUT PLUG | | WASTE WATER RISER |

### *PIPE SYSTEMS*

COLD WATER PIPES (CW)

HOT WATER PIPES (HW)

GRAY WATER PIPES (GW)

HYDRONIC DRAIN WATER PIPES (DW)

BLACK WATER PIPES (BW)

0' 2' 4' 8' 16'


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www.civilanka.com




CLIENT :

ANDREW WOOD

PROJECT NAME :

REMANSO VILLAS

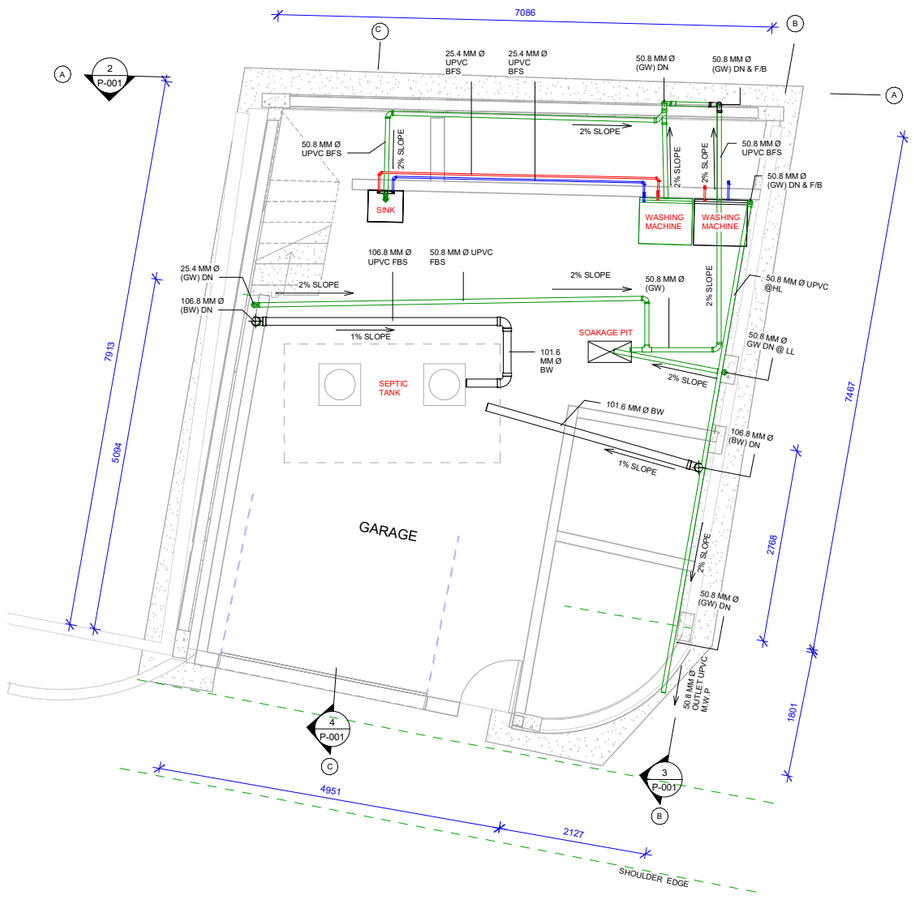
OFFICIAL STAMP :

| | | | |
|---|---|---|---|
| Project number | **01** | Date | **14/05/25** |
| Drawn by | **Author** | Checked by | **Checker** |

# PLUMBING GENERAL NOTES

P-000

Scale As indicated



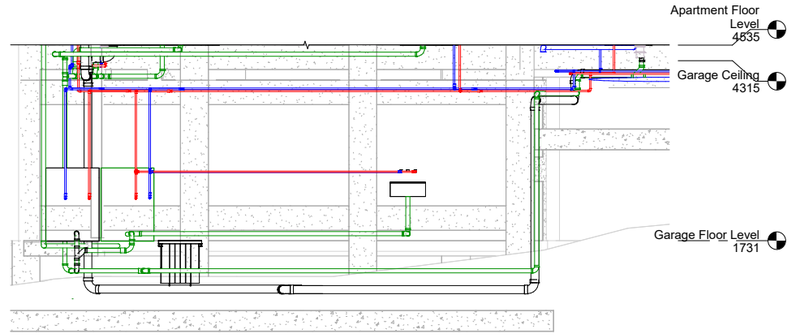

1 UNIT 1 WATER LAYOUT PLAN
1 : 40

HOT WATER PIPES (HW)

COLD WATER PIPES (CW)

GRAY WATER PIPES (GW)

BLACK WATER PIPES (BW)




2 SECTION U1 A-A
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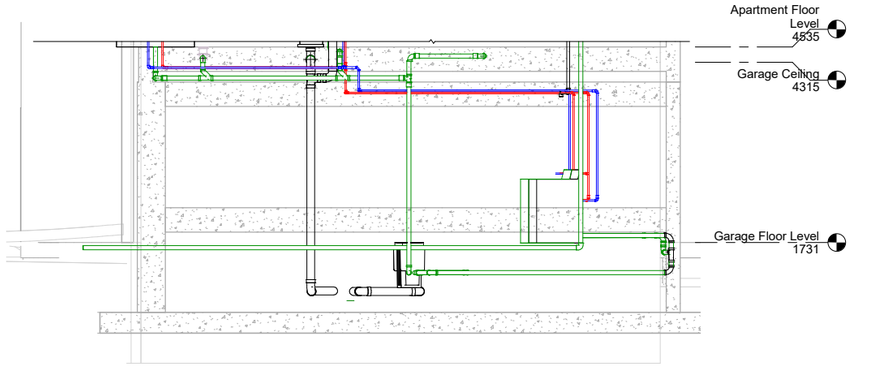
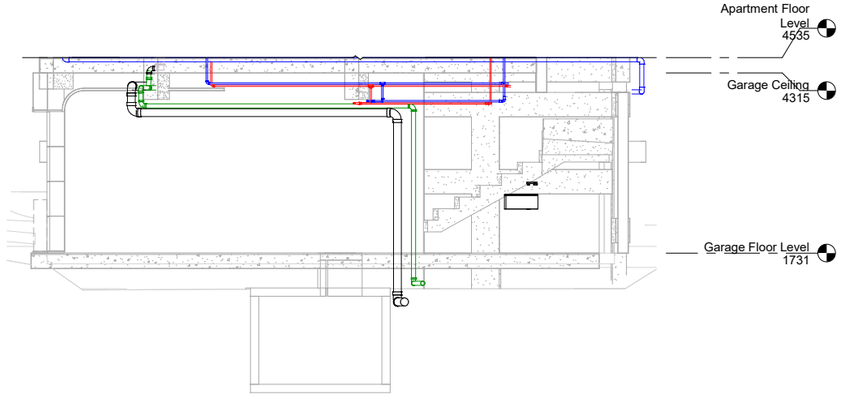



3 SECTION U1 B-B
1 : 40




4 SECTION U1 C-C
1 : 40

0' 2' 4' 8' 16'

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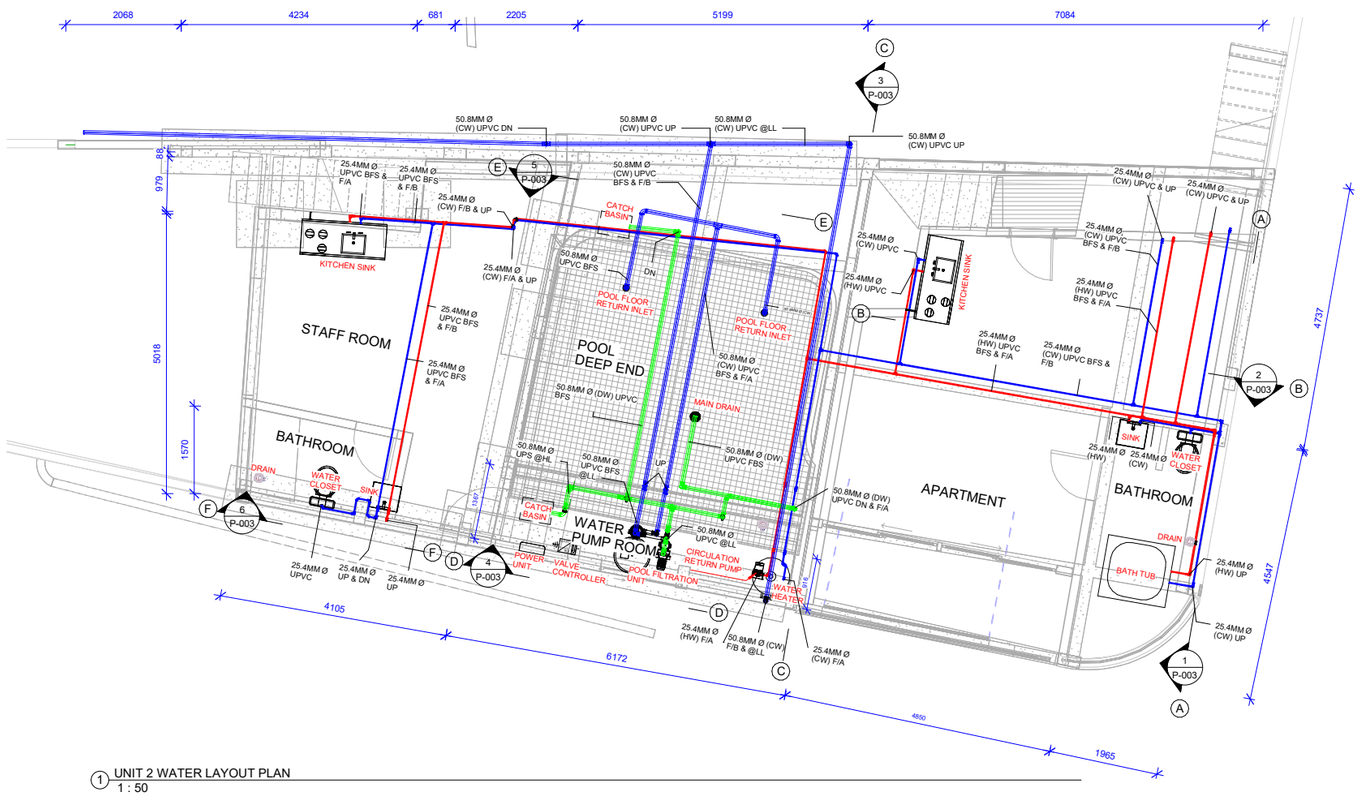
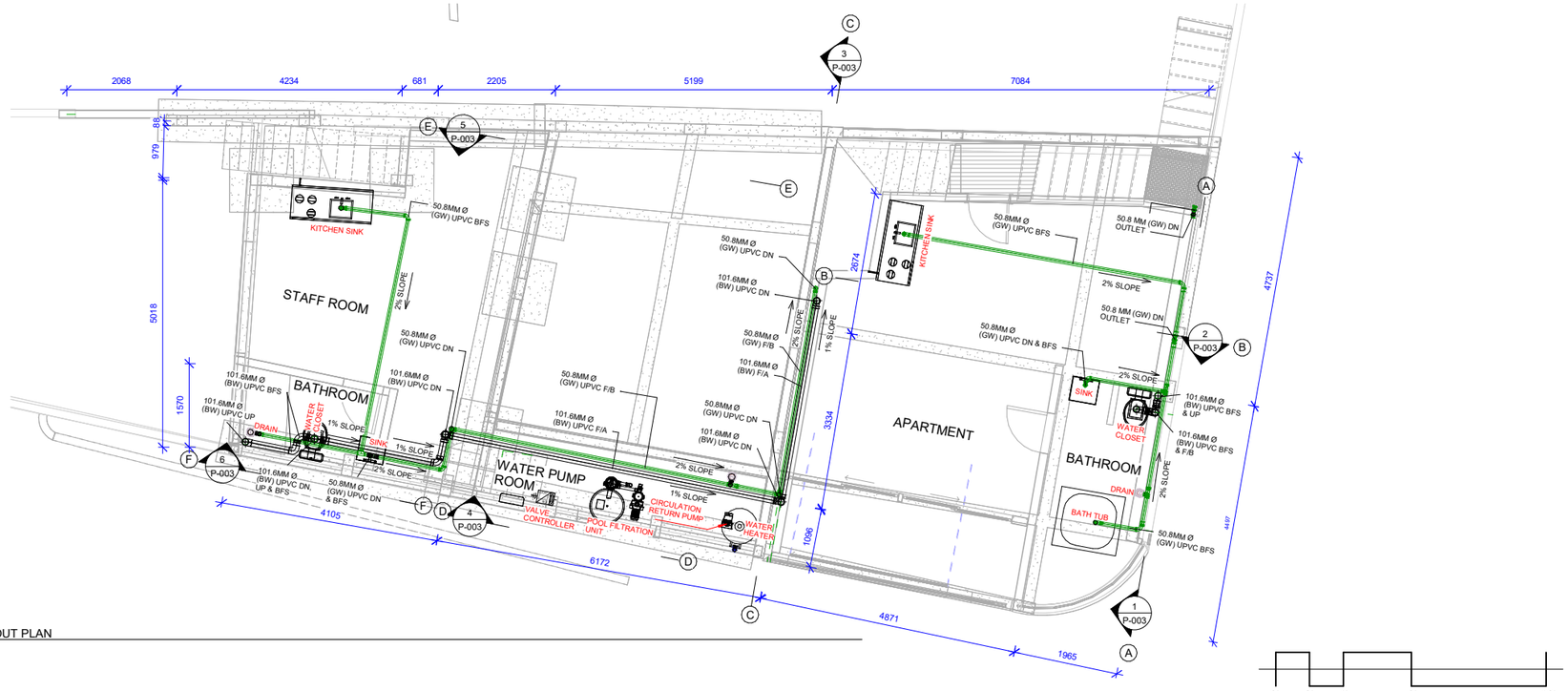
# UNIT 1 (GARAGE)

## P-001

Scale 1 : 40




1 UNIT 2 WATER LAYOUT PLAN
1 : 50




2 UNIT 2 SANITARY LAYOUT PLAN
1 : 50

0' 2' 4' 8' 16'

COLD WATER PIPES (CW)

HOT WATER PIPES (HW)

HYDRONIC DRAIN WATER PIPES (DW)

GRAY WATER PIPES (GW)

BLACK WATER PIPES (BW)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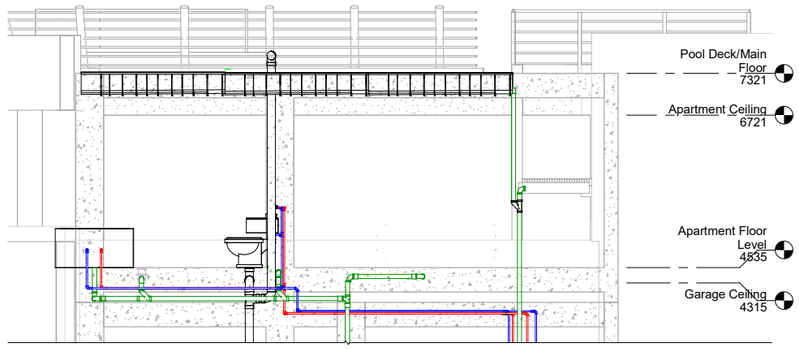
# UNIT 2 (APPARTMENT/PUPM ROOM/STAFF ROOM)

P-002

Scale 1 : 50

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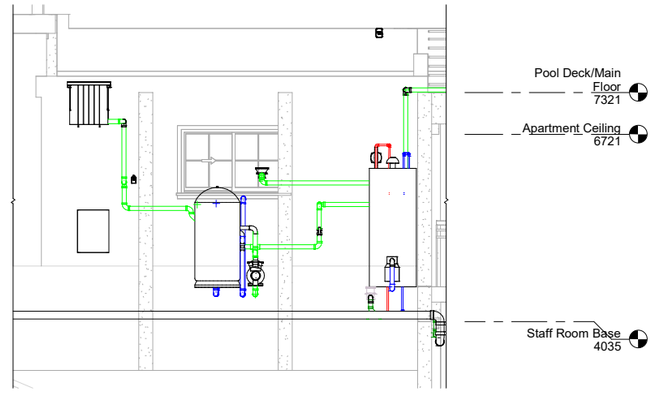


4 SECTION U2 D-D
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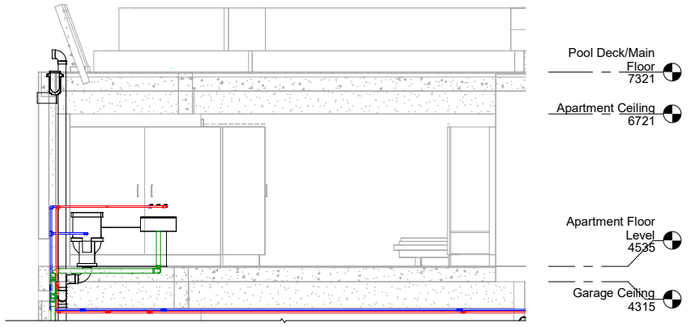


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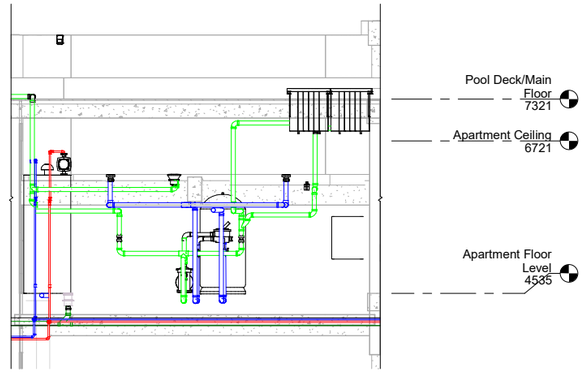
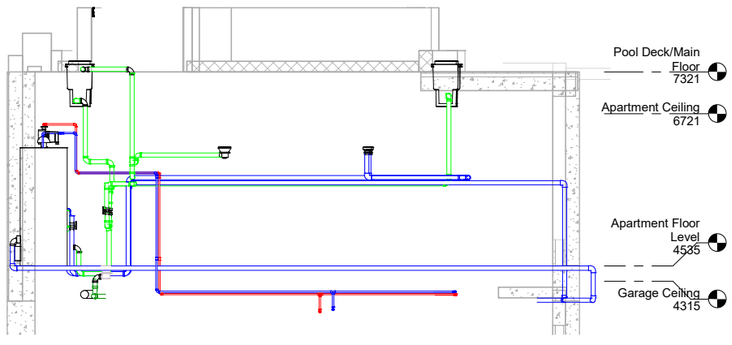
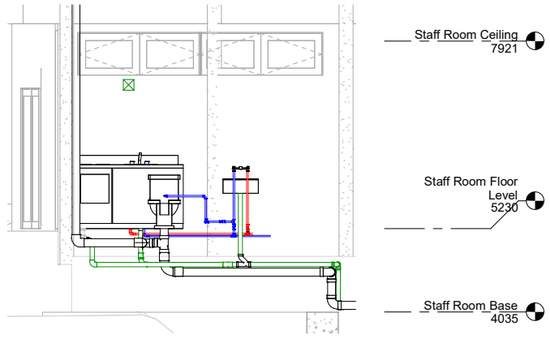



5 SECTION U2 E-E
1 : 40




3 SECTION U2 C-C
1 : 40




6 SECTION U2 F-F
1 : 40

0' 2' 4' 8' 16'

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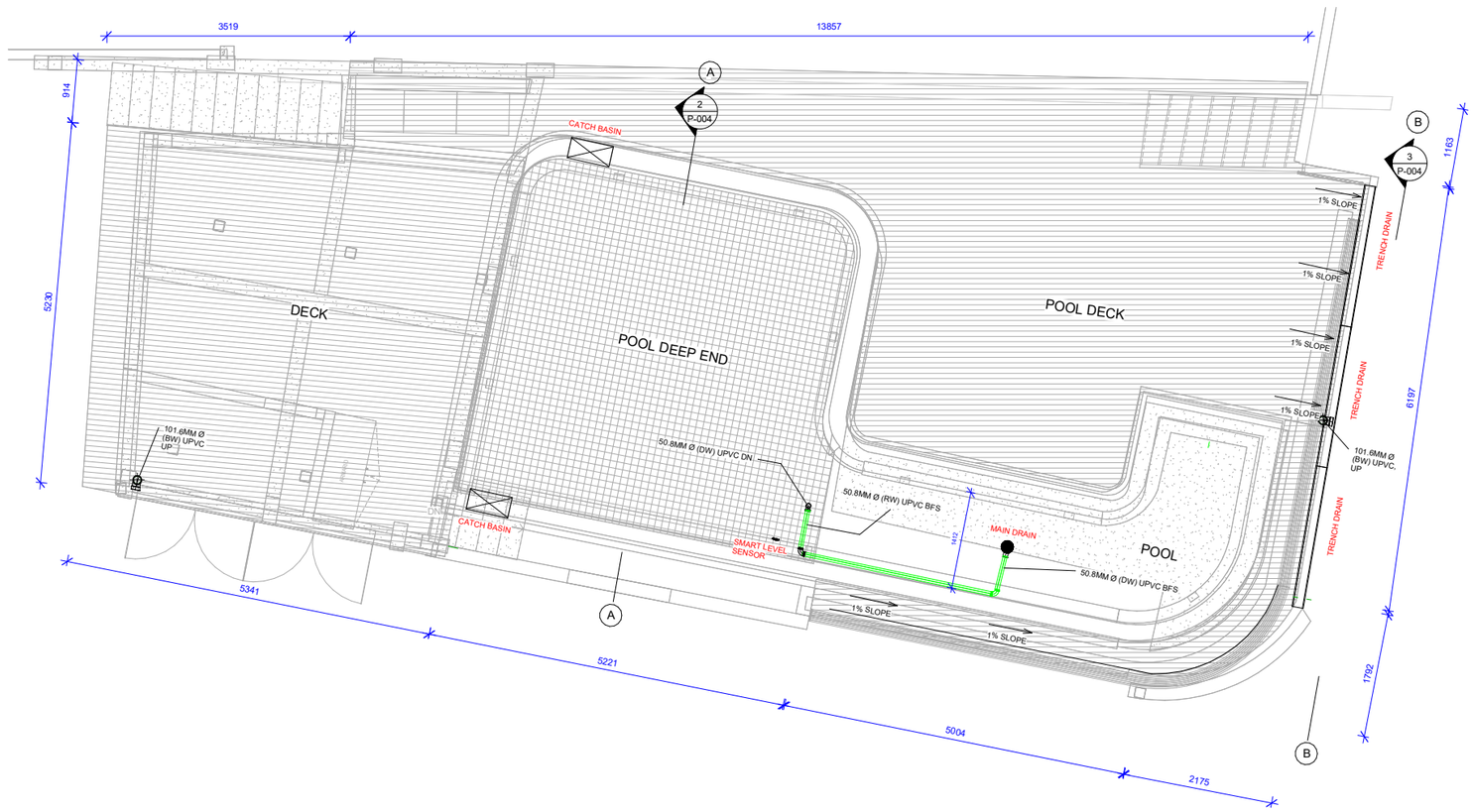
# UNIT 2 SECTION DETAILS

P-003

Scale 1 : 40




1 UNIT 3 WATER LAYOUT PLAN
1 : 40

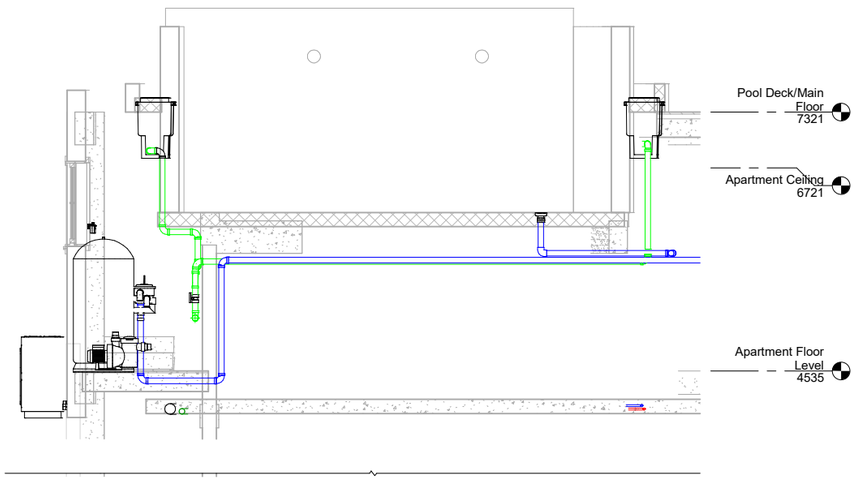
COLD WATER PIPES (CW)

HOT WATER PIPES (HW)

HYDRONIC DRAIN WATER PIPES (DW)

GRAY WATER PIPES (GW)

BLACK WATER PIPES (BW)




2 SECTION U3 A-A
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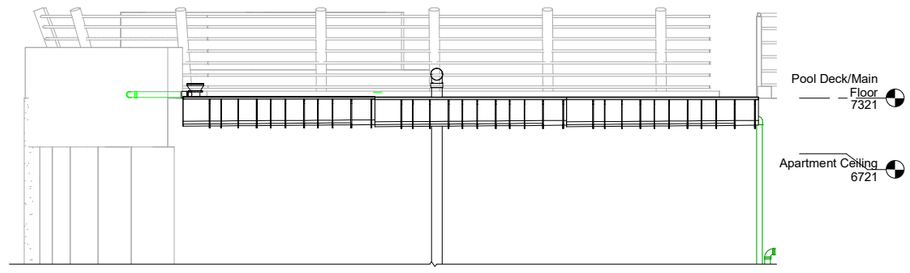


3 SECTION U3 B-B
1 : 30

0' 2' 4' 8' 16'

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# UNIT 3 (POOL/POOL DECK)

P-004

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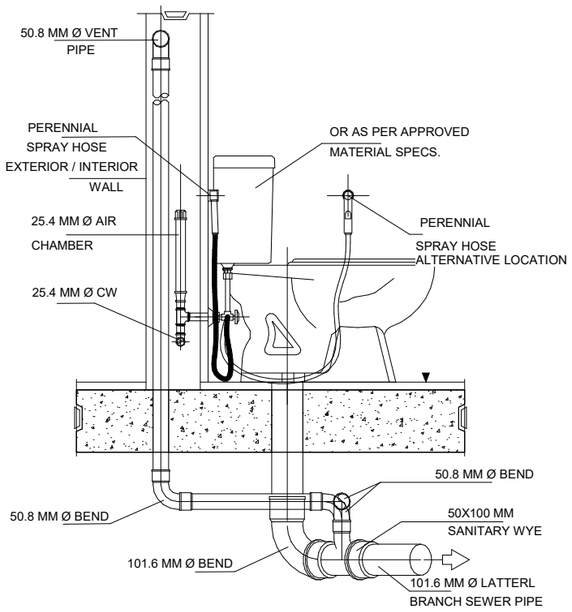
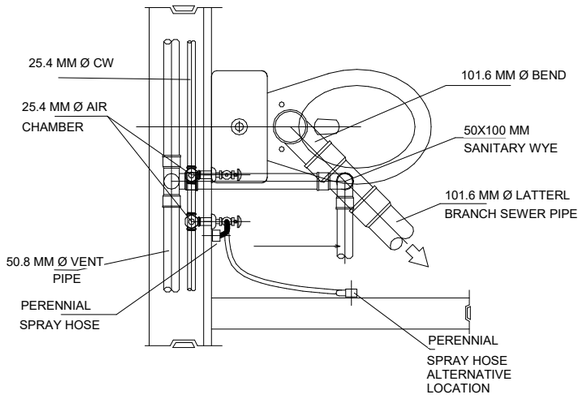
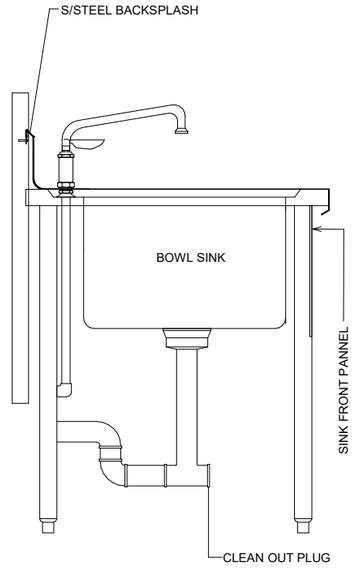
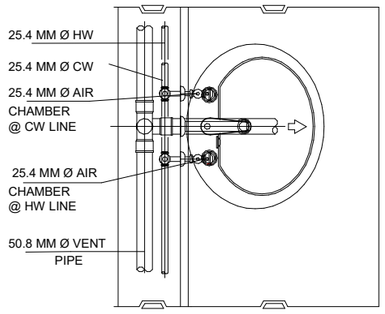


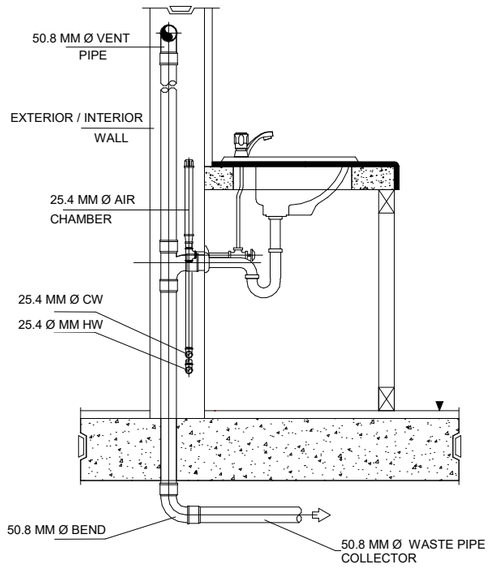




1 TYP. WATER CLOSET DETAILS
NTS




2 TYP. KITCHEN SINK DETAILS
NTS




3 TYP. BATHROOM SINK DETAILS
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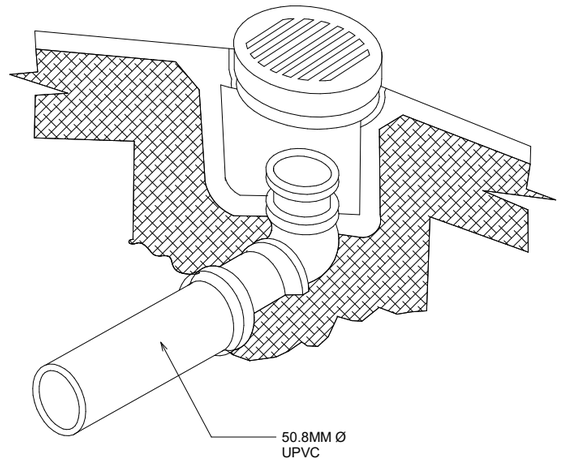


4 TYP. FLOOR DRAIN DETAILS
NTS

0' 2' 4' 8' 16'

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PLUMBING MOUNTING DETAILS 1.0

P-005

Scale As indicated

Hot Water Recirculation Pump

# GRUNDFOS
# ALPHA HWR

ALPHA HWR is a high-efficiency circulator fitted with a stainless steel housing. It is designed for circulating domestic hot water in systems with a dedicated return line.

It features an integrated digital timer which enables scheduling through the Grundfos GO app and eliminates the need for a physical programmable timer. The ALPHA HWR also allows homeowners the ability to set their own schedule through the Grundfos HOME App.

With the use of it's integrated sensor that estimates temperature, the ALPHA HWR helps reduce complexity during installation as an external temperature sensor is no longer needed.

The AUTOADAPT setting offers a simplified commissioning process, removing the need to decide what set point to use.

With FLOWSENSE, the ALPHA HWR can solve a number of challenges commonly found in domestic hot water recirculation systems. Through the use of flow limits, the ALPHA HWR reduces the risk of flow accelerated corrosion in the recirculation pipes by reducing the flow velocities while still providing enough flow to kick on the most common tankless boilers.

## KEY FEATURES AND BENEFITS

- Built-in Bluetooth Scheduling with Battery Backup
- Integrated Temperature Sensor
- Display read-outs (Flow, Head, Watts)
- Touch User Interface
- FLOWSENSE
- AUTOADAPT
- Dry-run Protection

**Grundfos GO app features:**
- Guided setup that recommends modes and settings for each specific application
- Ability to set a constant flow, minimum flow and max flow
- Scheduling
- Firmware update
- Trend data showing historical data for flow, head, media temperature and on-cycle durations
- Event log with warning and alarm overview
- Replacement compatibility check

**Grundfos HOME app features:**
- Scheduling
- Report for Troubleshooting

**APPLICATIONS**
- Hot water recirculation
  *For homes **with** dedicated return lines*

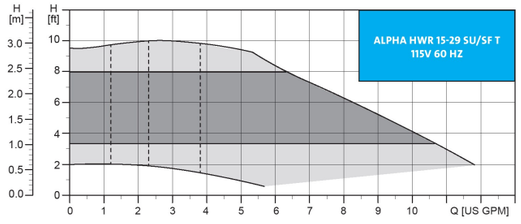
GRUNDFOS
Possibility in every drop

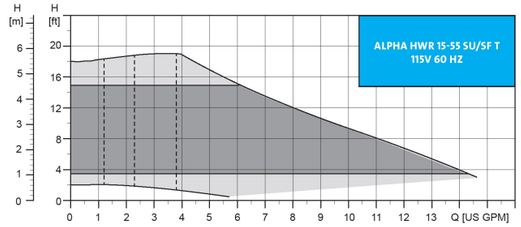
## TECHNICAL DATA

| COMFORT SYSTEM INFORMATION | |
|---|---|
| **FLOW, Q:** | max. 13.6 gpm |
| **HEAD, H:** | max. 18 ft (15-55)<br>max. 9.5 ft (15-29) |
| **MOTOR WATTS:** | 38 W |
| **VOLTAGE:** | 115V |
| **LIQUID TEMPERATURE:** | max. 230°F |
| **PORT TO PORT LENGTH:** | 6.5 in (Flange)<br>5.9 in (Union) |
| **PUMP HOUSING:** | Stainless Steel |
| **CONNECTION TYPE:** | Union and Flange Connections |

| PRODUCT NUMBER | DESCRIPTION |
|---|---|
| **92603111** | ALPHA HWR 15-55 SU/T 115V 9H |
| **92603113** | ALPHA HWR 15-29 SU/T 115V 9H |
| **92603110** | ALPHA HWR 15-55 SF/T 115V 9H |
| **92603112** | ALPHA HWR 15-29 SF/T 115V 9H |

## PERFORMANCE DATA




Visit **grundfos.us/pei** to learn more about Department of Energy (DOE) pump energy index (PEI) requirements and PEI ratings on specific Grundfos models.

GO

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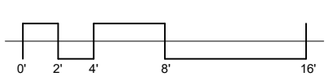
GRUNDFOS

Pub. no. DM00232 / 0324



1 HOT WATER RETURN SYSTEM
NTS

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PLUMBING MOUNTING DETAILS 1.1

P-006

Scale NTS

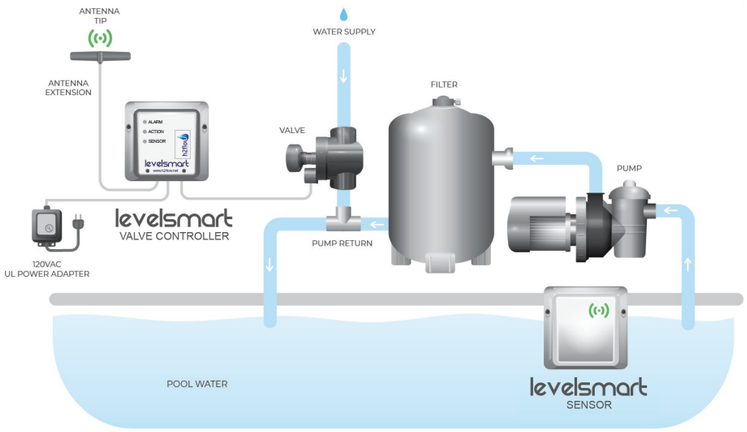


**Fig.1.0**

The overall principle of operation of the LevelSmart system is as follows:

During setup, the Level Sensor is taught the desired water level. When the Level Sensor detects a low level, it communicates this condition to the valve controller via a wireless signal. The valve controller opens the water supply valve for 7 minutes to restore the desired level. Every 30 minutes, the valve controller will repeat the process until the desired water level has been achieved. A maximum number of (8) repeat simultaneous cycles will occur, after which an Alarm LED will illuminate on the valve controller. Most low water level conditions will be restored within 1 to 2 cycles.

## 3 WHAT'S IN THE BOX


LevelSmart valve controller

LevelSmart level sensor

Automatic valve

Antenna

Accessory kit: epoxy, (x2) wire nuts, (x2) screws

Power supply

Antenna extension cable (optional)


Quick Start Guide





① POOL AUTOFILL SYSTEM DETAILS I
NTS

0' 2' 4' 8' 16'

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CLIENT :

ANDREW WOOD

PROJECT NAME :

REMANSO VILLAS

OFFICIAL STAMP :

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|---|---|---|---|
| Project number | 01 | Date | 14/05/25 |
| Drawn by | Author | Checked by | Checker |

PLUMBING MOUNTING DETAILS 1.2

P-007

Scale NTS

## 4 INSTALLATION AND SETUP

While most aspects of the installation can be undertaken by a person with good DIY skills, the installation of the Valve should only be undertaken by a person that is skilled or proficient in the plumbing of PVC pipe.

The following step-by-step procedures are required for the systems installation:

a. Install the Valve
b. Install and connect the Valve Controller
c. Connect the Antenna
d. Install the Power Supply and connect to the Valve Controller
e. Pair the Level Sensor and Valve Controller
f. Mount the Level Sensor
g. Mount the Antenna
h. Set and calibrate the water level

### a) Installing the Valve

The valve has 1" Female NPT sockets on each end. The valve also has a directional arrow molded into the top of the sockets, it is essential that the valve is installed so that the arrow points in the direction of water flow from its source to the pool return line. The most common method of installing the valve is via a 'T' that you will plumb into the existing return line to the pool. The preferred location is after the filter and before any chemical injection points. An appropriately sized adapter with a 1" female thread should be glued into the socket of the 'T'. A short 1" NPT nipple should be threaded into the adapter and the downstream side of the valve threaded onto the other end of the nipple.



If you are able to hard plumb the upstream side of the valve into a freshwater supply line, then this is the preferred method. However, you should make sure that a provision is made to drain this line for winterizing your equipment. If hard plumbing is not an option, then you can connect the upstream side of the valve to a garden hose and spigot. Thread into the upstream side of the valve a 1" male NPT to ¾" female NPT adapter. Into this, thread in a ¾" male NPT to ¾" MHT (male hose thread) adapter. Now connect a suitable length garden hose from the valve to a spigot. If the spigot serves another garden hose, install a 'Y' and connect both the LevelSmart hose and the existing garden hose. Make sure that the homeowner is informed that the valve on the 'Y' to the LevelSmart is never turned off. If possible, affix a tag to inform people not to turn it off.

**Important Note:** Many local jurisdictions require a non-return / backflow preventer when installing fill lines or irrigation systems to city water supplies. It is the installer's responsibility to check into this and to install an appropriate device if necessary.

### b) Install and connect the Valve Controller

The valve controller should be mounted on the wall next to the equipment pad and no more than 6 feet from the valve installed in section a) above. Stainless steel screws and plastic wall plugs are provided for your convenience.

The 6-foot-long black wire (with red and black wire tails), coming from the bottom right-hand side of the valve controller should be connected to the two red wires connected to the solenoid of the valve. Note that this is 24 VAC power and therefore not polarity sensitive; the black and red wires coming from the valve controller can be connected to either of the red wires coming from the valve. Wire nuts are provided.

### c) Connect the Antenna

Connect the Antenna plug to the socket on the lower left of the valve controller. Do not mount the Antenna at this time, but place it loosely in a location where it can see the pool and where it can be adhered if a successful pairing of the Level Sensor to the Valve Controller is achieved. Keep the Antenna at least 12 inches away from any metal as this will interfere with the wireless communication between the Level Sensor and Valve Controller.



### d) Install and connect the Power Supply to the Valve Controller

Identify a 120 VAC power outlet at the equipment pad and mount the power supply to the wall or zip tie it to a suitable structure that will be close enough to connect the Valve Controllers power cable to the 2-pin outlet at the base of the Power Supply.

Connect the Power Supply's outlet 2-pin socket to the Valve Controller's 2-pin plug and tighten the nut to seal the connection from water ingress.

Connect the Power Supply's 120 VAC plug into the outlet.

At this point you should see the three LED's on the front of the Valve Controller flash in a repetitive sequence from the bottom to the top (green, yellow red).

Fig.1.1

### e) Pair the Level Sensor and Valve Controller

Take the Level Sensor (Fig.1.2) to the area of the pool that you intend to install it. The throat of a skimmer is a common location. Do not mount the Level Sensor yet. With the Level Sensor close to the installation location, remove the magnet from the front face. You will now see three flashes of the green LED at the top center of the Level Sensor, this indicates that the Level Sensor has initiated its pairing sequence with the Valve Controller.

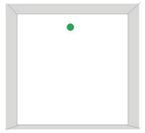
Fig.1.2



Remove the outer plastic skin from the two-part epoxy putty. Knead the epoxy thoroughly until its color is consistent (no white streaks). To protect the face of the Sensor from the epoxy, place the plastic Ziplock bag in the palm of your hand and then place the Level Sensor, face down, on top of the bag. Now evenly spread all of the mixed putty onto the back of the Level Sensor while trying to avoid any coming too close to the edges. Gently place the Level Sensor on the wall of the pool, making sure to a) keep the upper part of the back of the Level Sensor and the side of the pool dry, and b) ensuring the desired water level is somewhere between 0.5 to 1.5 inches up from the bottom of the Level Sensor's face. Press the Level Sensor on as hard as you can and give it a small rotational movement back and forth to achieve a more even spread of the putty. Make sure that the Level Sensor is vertical and then keep pressure on the face for at least 90 seconds. Do not try to pull it off after the 90 seconds as the putty will continue to cure for the next hour or two.

### g) Mount the Antenna

Peel the backing tape off the rear of the Antenna. Mount the Antenna close to where it was located during pairing process. Make sure to not mount the Antenna on or within 12 inches of metal.

### h) Set and calibrate the water level

This step will teach the LevelSmart system the desired water level that it is to maintain.

With the water at its desired level, place the magnet over the bottom right corner of the Level Sensor for 2 seconds before removing it (see Fig.1.4).

A green LED will appear at the top center of the Level Sensor and will flash three times; this indicates that calibration has begun. A green Sensor will also flash on the Valve Controller for about one-minute as the water level is set.

The calibration process will conclude with a solid green Sensor light on the Valve Controller. The LevelSmart may start a fill cycle for 7 minutes after this stage – this is normal. An indication that the valve is open and water is being added is indicated by the Action LED being illuminated.

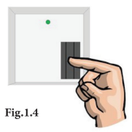
Fig.1.4



Leaving the Level Sensor at the pool side, go back to the Valve Controller (Fig.1.3)

When looking at the Valve Controller, you should see the yellow (Action) LED flash once per second, 30 times. After this, the yellow LED will flash every 4 seconds for a further 2 minutes. Finally, the green (Level Sensor) LED light will illuminate. This solid green Level Sensor LED indicates a successful pairing and that the intended location for the Level Sensor in the pool is a good one.

If a solid green Level Sensor LED does not appear at the end of the 2.5 min, then the Valve Controller will either go back into a pairing mode (the three LED's scrolling from bottom to top), or a solid yellow Action LED will illuminate.

Fig.1.3

If the unit goes back into either of these conditions, we need to move the Level Sensor or Antenna to different loations so that they can better see each other. Alternatively, the Antenna's cable may need to be extended using the optional 25-foot cable.

If the system does not go back into pairing mode, simply unplug the power supply for 10 seconds before plugging it back in again.

### f) Mount the Level Sensor

Once a successful pairing has occurred, we can go ahead and install the Level Sensor. Before doing so, bring the water to the desired level.

It is critical to thoroughly clean / scrub the area where the Level Sensor is to be installed. Now thoroughly dry the area above the water line where the Level Sensor is to be mounted.



1 POOL AUTOFILL SYSTEM DETAILS II
NTS

0' 2' 4' 8' 16'

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PLUMBING MOUNTING DETAILS 1.3

P-008

Scale NTS

## 6 ADJUSTING THE WATER LEVEL

Should it become necessary to adjust the existing calibrated water level, follow this procedure:

- Make sure the Valve Controller is displaying a solid green Sensor LED
- Bring the water level to the new desired level and make sure it is somewhere between 0.5” and 1.5” from the bottom of the Sensor housing.
- Use the magnet to reset the sensor in the pool by holding the magnet on the face of the sensor for five (5) seconds as shown in Fig1.6.
- When the magnet is removed after five (5) seconds, ensure three (3) green flashes are seen from the LED in the top center position.
- Observe the Valve Controller’s green Sensor LED flash for approximately one minute as it recalibrates the new water level.
- Ensure that the green Sensor LED turns solid green after the one minute.

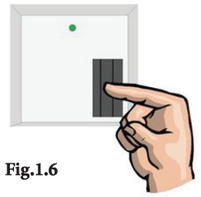


**Fig.1.6**



## 7 VALVE FLOW CONTROL ADJUSTMENT

The Valve flow rate can be adjusted to the user’s specific application, i.e., for a Pool, the flow control knob shown in Fig.1.7, should be fully open (turned counterclockwise), whereas on a small body of water such as a Spa, it should be at least 50% closed (turning it clockwise to do so). A fully closed flow control knob will result in zero flow.

Other features of the Valve are as follows:

a. **Solenoid.** This is operated electrically by the LevelSmart Valve Controller. The solednoid can be operated manually by opening it ¼ turn counterclockwise to allow flow through the valve. However, the solenoid must always be left in its closed position (fully clockwise), for the LevelSmart to function and top avoid over-filling the pool.
b. **Flow Control Knob.** For pools, leave all the way open. For smaller bodies of water such as spas or ponds, close half-way down.
c. **Bleeder Knob.** Do not adjust.
d. **Arrow.** Make sure water flow is in the direction indicated by the arrow.

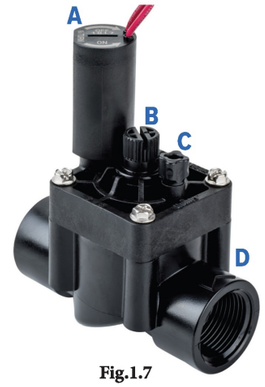
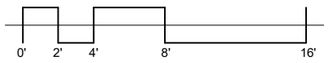



**Fig.1.7**



1 POOL AUTOFILL SYSTEM DETAILS III
1 : 32

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PLUMBING MOUNTING DETAILS 1.4

P-009

Scale 1 : 32

# Plastitank FOSA Y FAFA

RESISTENCIA POR GENERACIONES

La fosa séptica consiste en un tanque de polietileno que sirve como tratamiento primario anaerobio, donde se produce una sedimentación de residuos y digestión de la materia orgánica. Además del almacenamiento de lodos que resulta del proceso de digestión, esta unidad permite alcanzar una reducción significativa de sólidos suspendidos, Demanda Bioquímica de Oxígeno (DBO), Demanda Química de Oxígeno (DQO) y Coliformes fecales. Suficiente para alcanzar un periodo de retención hidráulica de 24 horas más un volumen de almacenamiento de lodos.

Luego de la fosa séptica las aguas ingresan al FAFA, FILTRO ANAEROBIO DE FLUJO ASCENDENTE, que consiste en un tanque de polietileno rellena de un lecho filtrante, pedazos de plástico, piedra o cualquier otro material filtrante, en el cual las aguas residuales fluyen hacia arriba poniéndose en este transcurso en contacto con una población de bacterias anaeróbicas que se desarrollan en el material de relleno. Esta población bacteriana normalmente no es arrastrada con el efluente, obteniéndose altos períodos de retención celular con bajos tiempos de retención hidráulica.


## Beneficios

- Separar sólidos de la parte líquida.
- Digestión anaerobia; para la remoción de la materia orgánica.
- Almacenar los sólidos separados o sedimentados.
- Permitir la descarga del líquido clarificado para su posterior tratamiento.

## Especificaciones Fosa Séptica y Fafa

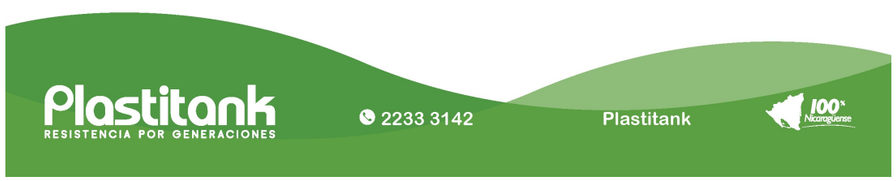
| Capacidad lts. | Díametro m | Altura m | |
|---|---|---|---|
| 750 | 0.97 | 1.25 | 5 |
| 1,100 | 1.12 | 1.37 | 6 |
| 1,850 | 1.32 | 1.50 | 9 |
| 2,500 | 1.60 | 1.60 | 14 |
| 5,000 | 2.32 | 1.50 | 25 |
| 10,000 | 2.32 | 2.72 | 60 |
| 22,000 | 2.82 | 3.64 | 123 |

## Mantenimiento

• Realizar una inspección del tanque cada año o de acuerdo al tiempo de limpieza especificado por el fabricante, para determinar la cantidad de nata acumulada en la superficie del agua y el espesor de la capa de lodo acumulada en el fondo. Al Abrir el tanque séptico para realizar la inspección o limpieza, se debe dejar ventilando al menos 30 minutos para la evacuación de los gases producidos por la degradación anaerobia, nunca deben encenderse fósforo ni cigarrillos, para evitar riesgos de explosión o asfixia.

• Esta inspección se debe realizar utilizando una vara o tubo de PVC de Ø 1”, de 2.5m a 3 m, de longitud y envolver la parte inferior (1.0 m) con un trapo blanco e introducir la vara hasta tocar el fondo del tanque de la fosa séptica y mantenerlo ahí durante cinco minutos para permitir que los fangos penetren en el trapo. Retirar la vara y medir la parte de coloración más oscura que se corresponde con la profundidad de lodos. Si la medida es superior a H/3, de la altura útil del tanque para tanque de (1100 y 2500 litros) ó H/2 de la altura del tanque cm., la fosa séptica debe ser vaciada.

• Los lodos sedimentados deben extraerse por medio de una bomba de succión de semisólidos o de forma manual. Al extraer los lodos, debe tenerse el cuidado de no extraerlos en su totalidad, pues se necesita una pequeña fracción de los mismos (aproximadamente un 5% del volumen útil) para el tratamiento biológico. Únicamente hay que extraer los lodos oscuros, cuando se observe un cambio de coloración del agua de oscuro a gris se debe detener la evacuación, se recomienda escoger cuando la entrada de agua residuales sea mínima o nula al tanque séptico.


1 SEPTIC TANK INSULATION DETAILS
1 : 17

0' 2' 4' 8' 16'

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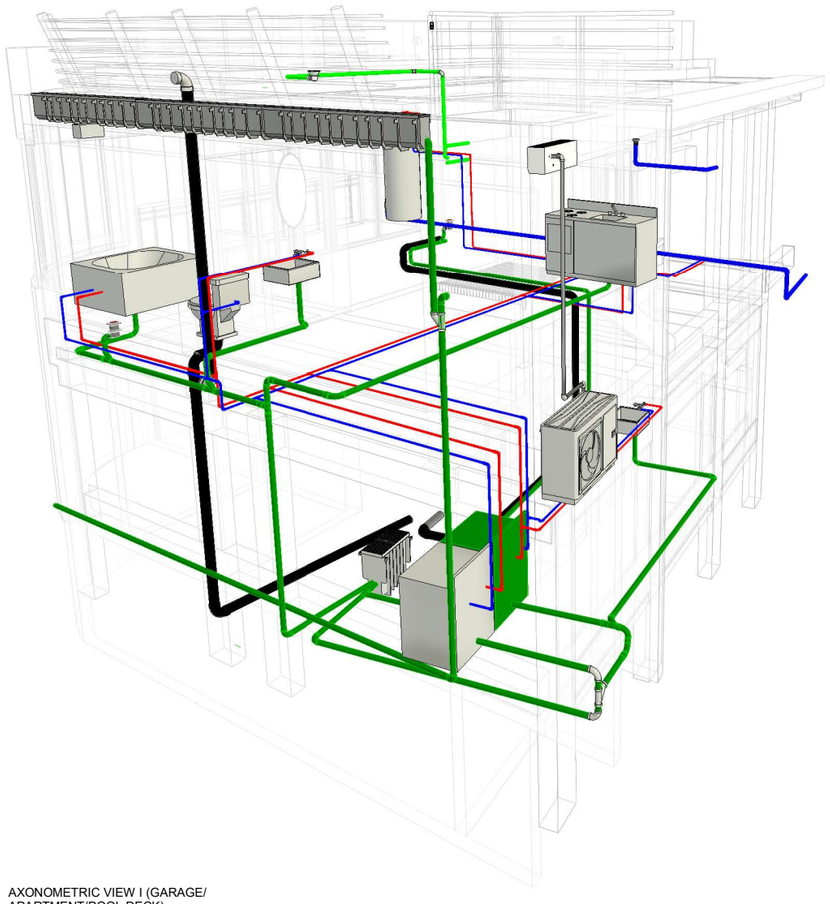
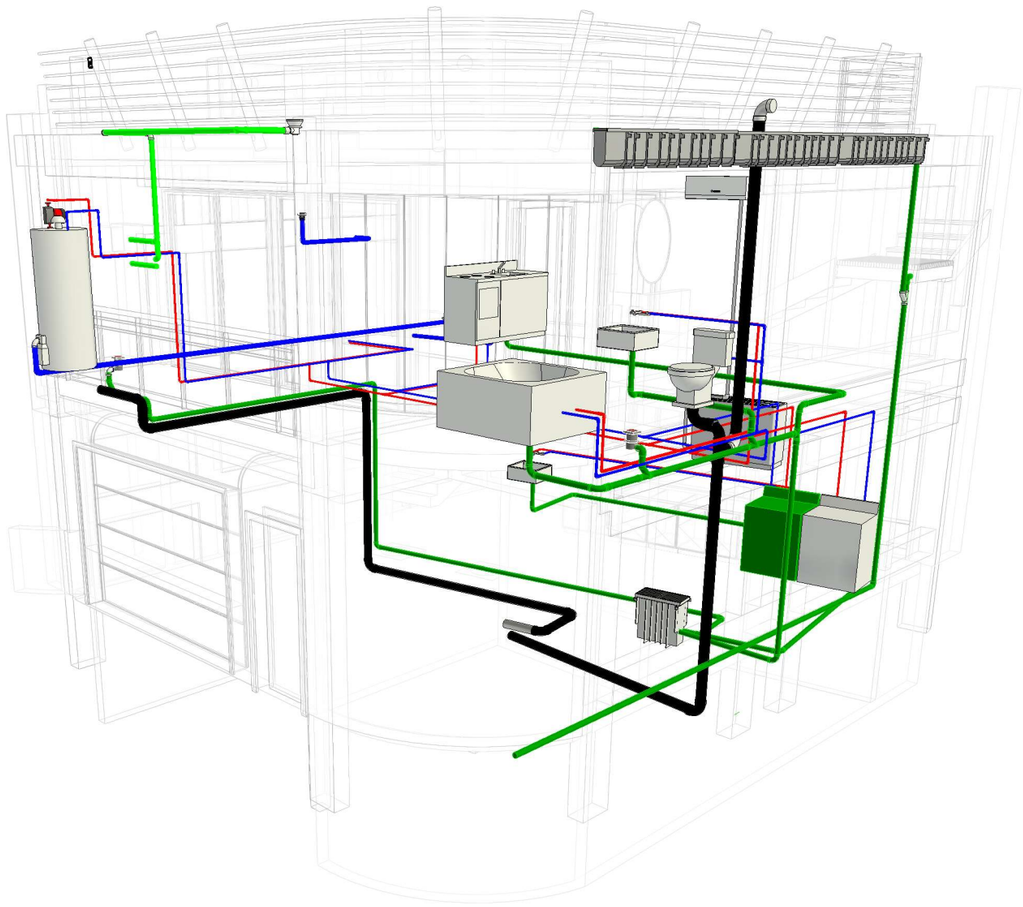
PLUMBING MOUNTING DETAILS 1.5

P-010

Scale 1 : 17



1 AXONOMETRIC VIEW I (GARAGE/ APARTMENT/POOL DECK)



2 AXONOMETRIC VIEW II (GARAGE/ APARTMENT/POOL DECK) Copy 1

0' 2' 4' 8' 16'

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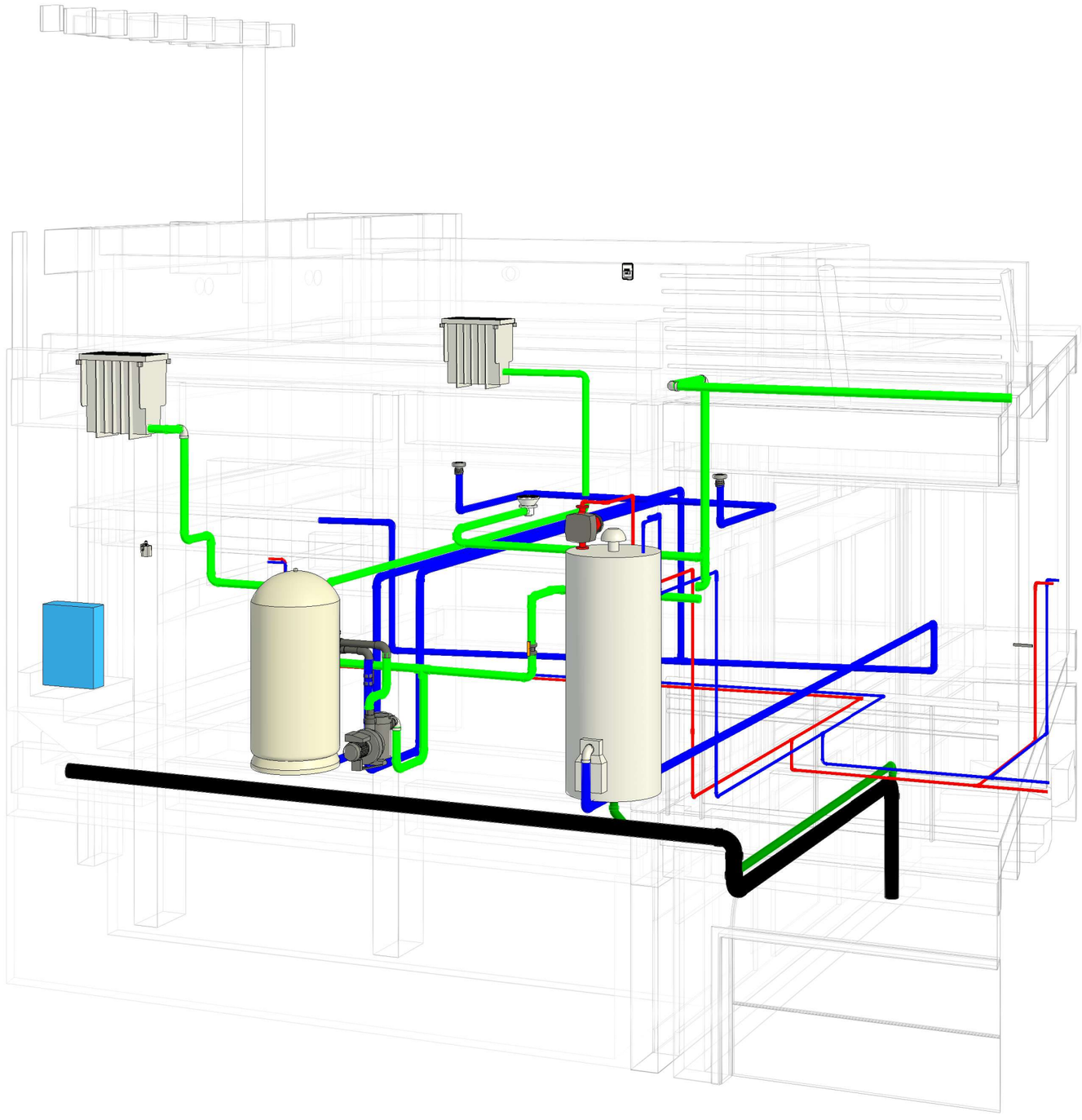
# AXONOMETRIC VIEWS 01

P-011

Scale



AXONOMETRIC VIEW I (PUMP ROOM/POOL)
1

0' 2' 4' 8' 16'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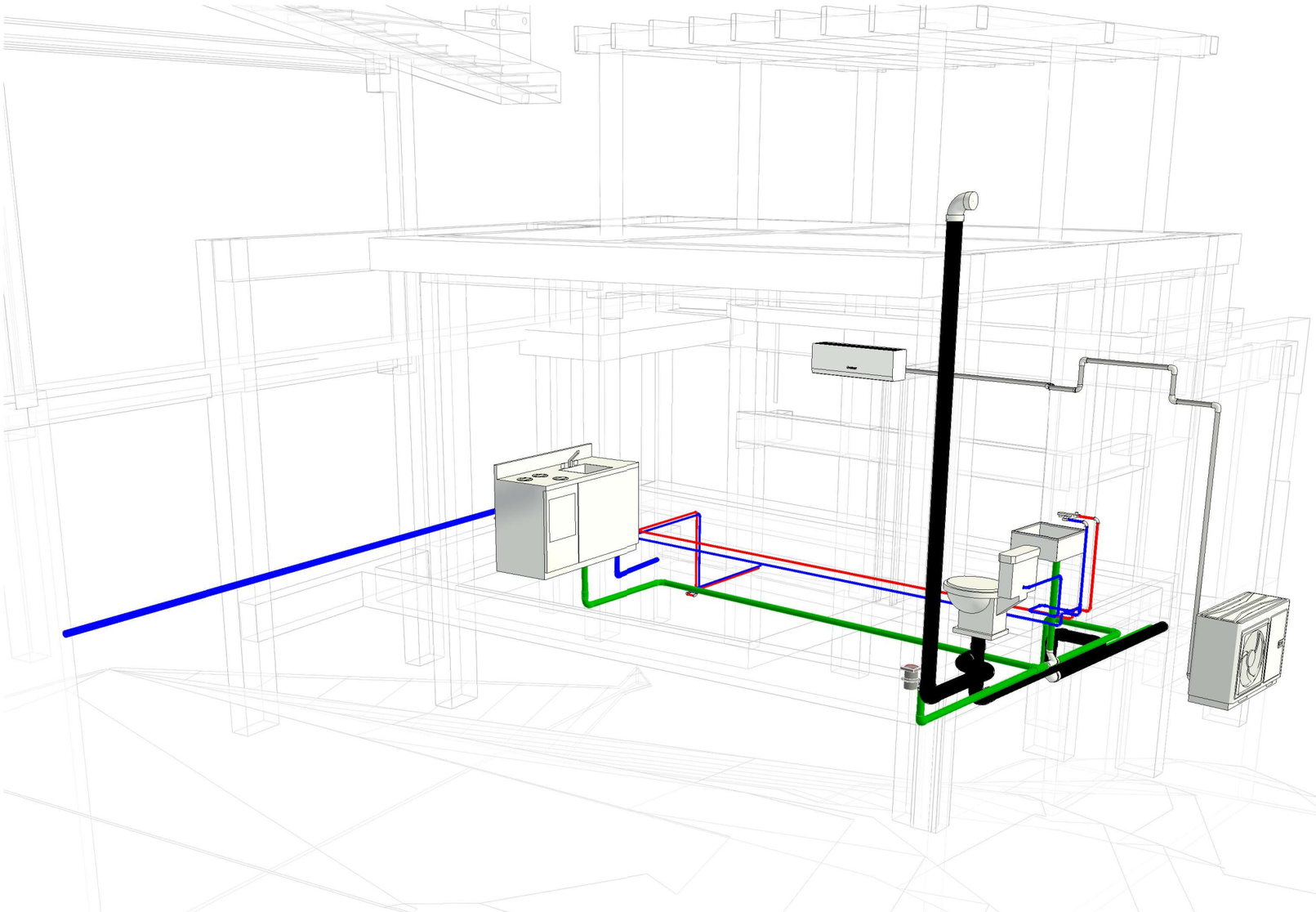
# AXONOMETRIC VIEWS 02

P-012

Scale



1 AXONOMETRIC VIEW I (STAFF ROOM)

0' 2' 4' 8' 16'

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# AXONOMETRIC VIEW 03

P-013

Scale

# REMANSO VILLA

San Juan Del Sur, Rivas, Nicaragua

## ELECTRICAL GENERAL NOTES

1. GENERAL

1.1. APPLICABLE CODES: ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE REQUIREMENTS
OF THE FOLLOWING:

• 2014 NATIONAL ELECTRICAL CODE
• 2018 INTERNATIONAL BUILDING CODE
• REGULATIONS FOR LOCAL AUTHORITIES HAVING JURISDICTION
• OSHA REGULATIONS
• 2018 INTERNATIONAL ENERGY CONSERVATION CODE

1.2. CONTRACTOR SHALL BE RESPONSIBLE FOR VISITING THE SITE AND VERIFYING ALL EXISTING FIELD CONDITIONS. EXACT LOCATION AND MOUNTING HEIGHTS OF JUNCTION BOXES, OUTLETS, STUB-UP, ETC, SHALL BE DETERMINED FROM CONTRACT DOCUMENTS OR AS BUILT LOCATIONS. MOUNTING HEIGHTS OF WIRING DEVICES SHALL FOLLOW APPLICABLE CODE REQUIREMENTS WHEN NOT DEPICTED ON DRAWINGS. THE ELECTRICAL WORK SHALL CONFORM TO APPLICABLE STATE AND LOCAL CODES AND THE REQUIREMENTS OF THE AUTHORITIES HAVING JURISDICTION. ALL ELECTRICAL WORK SHALL BE PERFORMED BY A CONTRACTOR LICENSED IN THE JURISDICTION OF INSTALLATION. THE CONTRACTOR SHALL HAVE QUALIFICATIONS AND EXPERIENCE IN INSTALLING ELECTRICAL EQUIPMENT. THE CONTRACTOR SHALL FOLLOW ALL MANUFACTURE'S INSTALLATION DOCUMENTATION. NO STRUCTURAL MEMBERS OR COMPONENTS SHALL BE CUT, NOTCHED, OR OTHERWISE ALTERED FOR THE INSTALLATION OF ELECTRICAL EQUIPMENT.

2. SHOP DRAWINGS

2.1. CONTRACTOR IS RESPONSIBLE FOR SUBMITTING SHOP DRAWINGS PRIOR TO THE START OF CONSTRUCTION FOR APPROVAL FOR PERMIT AND/OR CONSTRUCTION. THE SHOP DRAWINGS SHALL INDICATE WORK OF OTHER TRADES AND MUST BE SUBMITTED PRIOR TO FABRICATION AND INSTALLATION FOR APPROVAL FOR PERMIT AND/OR CONSTRUCTION.

3. EQUIPMENT AND DEFINITIONS

3.1. ALL ELECTRICAL EQUIPMENT SHALL BEAR THE UNDERWRITER'S LABORATORIES LABEL.

3.2. UNLESS SPECIFICALLY NOTED ON THE PLANS ALL CIRCUITRY, EQUIPMENT, DEVICES, ETC., NOT

NOTED AS EXISTING SHALL REMAIN IN THEIR CURRENT LOCATION. NEW EQUIPMENT SHALL BE PLACED IN THE LOCATION DESIGNATED IN THE DRAWING.

4. JUNCTION BOXES LABELING REQUIREMENTS

4.1. ALL JUNCTION BOXES FOR BRANCH CIRCUITRY SHALL BE CLEARLY LABELED WITH PANEL
DESIGNATION AND CIRCUIT NUMBERS.

5. PLANELOADS

5.1. PROVIDE A TYPED CIRCUIT DIRECTORY FOR THE ENTIRE PANELBOARD AS LABELED IN THE DESIGN DRAWINGS.

5.2. CONTRACTOR SHALL PHASE BALANCE ALL PANELBOARD AS NECESSARY.

5.3. THE BRANCH CIRCUITS ARE SHOWN FOR ITEMS THAT ARE CONNECTED TO THAT SERVICE.
CONTRACTOR SHALL FIELD COORDINATE ALL BRANCH CIRCUITS TO ENSURE PROPER CONNECTION TO THE REQUIRED SERVICE.

5.4. BRANCH CIRCUITRY SHOWN ON THE FLOOR PLAN CONNECTED TO A DESIGNATED CIRCUIT BREAKER SHALL BE INSTALLED AFTER REMOVAL OF OUTLETS UNDER DEMOLITION.

6. CIRCUIT BREAKERS

6.1. ALL NEW CIRCUIT BREAKERS TO BE INSTALLED IN NEW PANELS SHALL BE BOLT-ON TYPE.

7. SWITCHES, RECEPTACLES, TELEPHONE OUTLETS AND DATA OUTLETS

7.1. WHERE TWO OR MORE DEVICES OF THE SAME VOLTAGE ARE SHOWN TOGETHER ON THE PLANS, A GANGED PLATE SHALL BE USED. DEVICES OF DIFFERENT VOLTAGES SHALL BE SEPARATED HORIZONTALLY BY 6" BUT SHALL BE HORIZONTALLY OR VERTICALLY ALIGNED.

7.2. ALL RECEPTACLES, TELEPHONE, AND DATA OUTLETS SHOWN ON A WALL BACK-TO-BACK SHALL BE OFFSET A MINIMUM OF 6" HORIZONTALLY.

8. LIGHTING FIXTURES

8.1. COORDINATE ALL LIGHTING FIXTURES WITH SPRINKLERS, MECHANICAL EQUIPMENT AND ARCHITECTURAL CEILING PLAN TO AVOID INTERFERENCE. GRID LAYOUT ON PLANS IS APPROXIMATE, ADJUST AND COORDINATE LIGHTING FIXTURES IN FIELD PER ARCHITECTS REFLECTED CEILING PLAN.

8.2. PROVIDE FINISHED FRAMES FOR ALL RECESSED LIGHTING FIXTURES. PROVIDE ALL MOUNTING
ATTACHMENTS FOR A COMPLETE INSTALLATION. LIGHTING FIXTURES SHALL BE SUPPORTED IN ALL DIRECTIONS PER LOCAL CODE REQUIREMENTS.

8.3. ALL NEW LIGHTING FIXTURES SHALL BE INSTALLED COMPLETE WITH LAMP BULBS. SEE LIGHTING FIXTURE SCHEDULE FOR LAMP BULBS AND TYPE OF BALLASTS REQUIREMENTS.

8.4. COLOR OF LIGHTING FIXTURES SHALL BE AS SELECTED BY THE ARCHITECT.

9. BRANCH CIRCUITRY AND FEEDER

9.1. ALL CONDUCTORS SHALL BE COPPER.

9.2. ALL BRANCH CIRCUITRY AND FEEDER SHALL COMPLY WITH THE UTEST NATIONAL ELECTRICAL CODE (N.E.C.) LOCAL JURISDICTION AND LOCAL STATE CODE REQUIREMENTS.

10. INDOOR USE BRANCH CIRCUITRY

10.1. METAL CLAD CABLE (MC CABLE) IS PERMITTED TO SERVE RECEPTACLES/LIGHTING AND OTHER EQUIPMENT LOAD. METAL CLAD CABLE ARE PERMITTED TO RUN ONLY IN CONCEALED AREAS SUCH AS CEILING SPACES AND FINISHED WALL AREAS. CONTRACTOR SHALL FOLLOW ELECTRICAL SYMBOLS LIST. ALL HOMERUN BRANCH CIRCUITRY FOR THE INDOOR EQUIPMENT SHALL BE INSTALLED IN EMT.

11. GENERAL NOTES IN REGARDS TO BRANCH CIRCUITRY AND FEEDER

11.1. USE OF ALUMINUM CONDUIT SHALL NOT BE PERMITTED.

11.2. ALL BRANCH CIRCUITRY AND FEEDERS SHALL BE RUN CONCEALED.

11.3. ALL CIRCUITRY RUNS ARE SCHEMATIC. THE CONTRACTOR SHALL DETERMINE IN THE FIELD THE MOST SUITABLE ROUTES.

11.4. MINIMUM SIZE EMT OR CONDUIT SHALL BE 3/4". UNLESS MULTIPLE HOMERUN CIRCUITS REQUIRES LARGER SIZE CONDUIT.

11.5. NO NONMETALLIC CONDUIT SHALL BE USED FOR BRANCH CIRCUIT WORK ABOVE GRADE.

12. WIRE AND CABLE

12.1. FEEDERS: FEEDER SHALL BE ALUMINUM. INSULATION SHALL BE THW OR THHN/THWN.

12.2. COLOR CODE: ALL WIRING SHALL BE COLOR CODED AS PER N.E.C. REQUIREMENTS.

12.3. ALL CONDUCTORS SHALL BE COPPER, MINIMUM #2 AWG.

12.4. ALL RECEPTACLES, LIGHTING FIXTURES, MOTORS, ETC. SHALL BE GROUNDED PER N.E.C. ALL RECEPTACLE CIRCUITS SHALL CONTAIN #12 INSULATED GROUND CONDUCTORS.

12.5. WHEN THE CONTRACTOR RUN CIRCUITRY IN MULTIPLE HOMERUNS, USE ALTERNATELY NUMBERED PANELBOARD CIRCUITS (I.E., 1,3,5) SERVING LIGHTING, GENERAL RECEPTACLES, AND MOTORS, ANY CIRCUITS SERVING ISOLATED GROUND RECEPTACLES, OR RECEPTACLES SERVING COMPUTER EQUIPMENT. CONTRACTOR SHALL OVERSIZE THE NEUTRAL CONDUCTOR TO A MINIMUM 200% OF THE CAPACITY OF PHASE CONDUCTORS SIZE OF THE EMT/CONDUIT ACCORDINGLY WHERE NECESSARY.

12.6. ALL EMPTY RACEWAYS SHALL CONTAIN A DRAG WIRE. EMPTY RACEWAYS 2" OR LARGER IN SIZE SHALL HAVE A MAXIMUM OR 2 - 90 DEGREES BENDS PER RUN. PROVIDE PULL BOXES PER N.E.C. REQUIREMENTS WHERE REQUIRED.

12.7. FINAL CONNECTION TO ALL MOTORS OR VIBRATING EQUIPMENT SHALL BE WITH FLEXIBLE CONDUIT OR LIQUID-TIGHT FLEXIBLE CONDUIT FOR OUTDOOR.

12.8. ALL 120 VOLT CIRCUIT HOMERUNS WHICH ARE OVER 100 LINEAR FEET SHALL BE A MINIMUM OF #10 CONDUCTORS OR AS NOTED ON THE PLANS.

12.9. EXPOSED AND CONCEALED CIRCUITRY SHALL BE RUN TIGHT TO THE FIXING SURFACE. ALL RUNS SHALL BE PARALLEL OR PERPENDICULAR TO BUILDING WALL.

13. GROUNDING

13.1. PROVIDE GROUND TO ALL DEVICES PER N.E.C. REQUIREMENTS.

13.2. PROVIDE SERVICE GROUND CONDUCTORS SIZE PER NEC REQUIREMENTS.

13.3. PROVIDE EQUIPMENT GROUND CONDUCTORS SIZE PER NEC REQUIREMENTS.

14. FIRE SEALANT MATERIALS

14.1. ANY PENETRATION TO THE FIRE WALLS. SHALL HAVE FIRE SEALANT MATERIALS AT EVERY POINT WHERE A PENETRATION IS LOCATED. FIRE SEALANT MATERIAL'S MANUFACTURER INFORMATION SHALL CONFORM TO CODE REQUIREMENTS.

15. FINAL TESTING

15.1. AT THE TIME OF FINAL INSPECTION AND TEST, ALL CONNECTIONS AND TERMINATIONS AT PANELBOARDS, DEVICES, EQUIPMENT, AS WELL ALL SPLICES MUST BE ALL COMPLETED. EACH BRANCH CIRCUIT AND ITS RESPECTIVE CONNECTED EQUIPMENT MUST TEST FREE OF SHORT CIRCUIT. ALL AREAS AND SURFACES MUST BE CLEANED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

16. TOXIC MATERIAL
IN THE EVENT THE CONTRACTOR ENCOUNTERS ON THE SITE MATERIAL REASONABLY BELIEVED TO BE ASBESTOS, POLYCHLORINATED BIPHENYL (PCB) OR OTHER TOXIC MATERIAL, WHICH HAS NOT BEEN RENDERED HARMLESS, THE CONTRACTOR SHALL IMMEDIATELY STOP WORK IN THE AREA AFFECTED, SEAL OFF THE PERIMETER, AND REPORT THE CONDITION TO THE OWNER IN WRITING. NO NEW BUILDING MATERIAL SHALL CONTAIN ASBESTOS, POLYCHLORINATED BIPHENYL (PCB) OR OTHER TOXIC MATERIAL AS DEFINED BY STATE AND FEDERAL REGULATORY AGENCIES.

## ELECTRICAL SYMBOLS

- PANELBOARD - SEE SCHEDULE. MOUNTING HEIGHT TO CENTERLINE ABOVE FINISHED FLOOR 6'-0"
- DISCONNECT SWITCH - SEE PANEL SCHEDULE FOR VOLTAGE, POLES AND AMPERAGE RATING.
- A-1 — HOMERUN TO PANELBOARD. NUMERALS AND LETTERS ADJACENT TO ARROWHEADS INDICATE ASSIGNED PANEL AND CIRCUIT NUMBERS. SEE PANEL SCHEDULE FOR AMPERAGE RATING OF EACH CIRCUIT BREAKER
- CIRCUITRY INSTALLED CONCEALED IN WALL OR ABOVE CEILING. SEE PANEL SCHEDULE FOR CONDUCTOR SIZES.
- $ — SINGLE POLE SWITCH. MOUNTING HEIGHT TO CENTERLINE ABOVE FINISHED FLOOR 4' - 0"
- $3 — THREE WAY SWITCH
- $4 — FOUR WAY SWITCH
- $MD — MOTORIZED DOOR SWITCH
- $E — EMERGENCY SWITCH
- $OS — SWITCH WITH OCCUPANCY SENSOR. 48" AFF MOTION SENSOR SHALL BE INSTALLED PER MANUFACTURER INSTRUCTIONS, WITH TIME DELAY SHALL BE SET @ LESS THAN 15 MINUTES
- WALL MOUNTED DUPLEX RECEPTACLE - 2P, 3W, 20A, 125V, GROUNDED MOUNTING HEIGHT TO CENTERLINE ABOVE FINISHED FLOOR 18" UON.
- WALL MOUNTED DOUBLE DUPLEX RECEPTACLE - 2P, 3W, 20A, 125V, GROUNDED MOUNTING HEIGHT TO CENTERLINE ABOVE FINISHED FLOOR 18" UON.
- 2-HEAD BATTERY LIGHTING UNIT
- EXIT LIGHTING FIXTURE ON EMERGENCY CIRCUITRY ARROWS AS INDICATED.
- OS OS — OCCUPANCY SENSOR - CEILING OR WALL MOUNTED
- J J — JUNCTION BOX - CEILING OR WALL MOUNTED
- DL — DAYLIGHT SENSOR
- SD — SMOKE DETECTOR
- SD/CO — SMOKE AND CARBON MONOXIDE DETECTOR
- SPECIAL OUTLET. COORDINATE EXACT NEMA CONFIGURATIONS OF OUTLET WITH OWNER'S REPRESENTATIVE AND EXACT MOUNTING HEIGHT PRIOR TO ROUGH-IN.

## ABBREVIATIONS

| | |
|---|---|
| A | AMPERE |
| AFF | ABOVE FINISHED FLOOR |
| AFCI | ARC-FAULT CIRCUIT INTERRUPTER |
| AIC | AMPERES INTERRUPTING CAPACITY C CONDUIT/EMT |
| C | CONDUIT |
| C/B | CIRCUIT BREAKER |
| EC | EMPTY CONDUIT/EMT. PROVIDE PULL WIRE |
| EMT | ELECTRICAL METALLIC TUBING |
| FACP | FIRE ALARM CONTROL PANEL |
| G | GROUND |
| GFCI | GROUND-FAULT CIRCUIT INTERRUPTER |
| HP | HORSEPOWER |
| MCB | MAIN CIRCUIT BREAKER |
| MTD | MOUNTED |
| NIC | NOT IN CONTRACT |
| KW | KILOWATTS |
| P | POLE |
| PH | PH |
| R | RECESSED |
| LF | LINEAR FEET |
| S | SURFACE |
| UON | UNLESS OTHERWISE NOTED |
| V | VOLT |
| W | WIRE |
| WP | WATERPROOF |

0' 2' 4' 8' 16'


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REMANSO VILLAS

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| Project number | **01** | Date | **14/05/25** |
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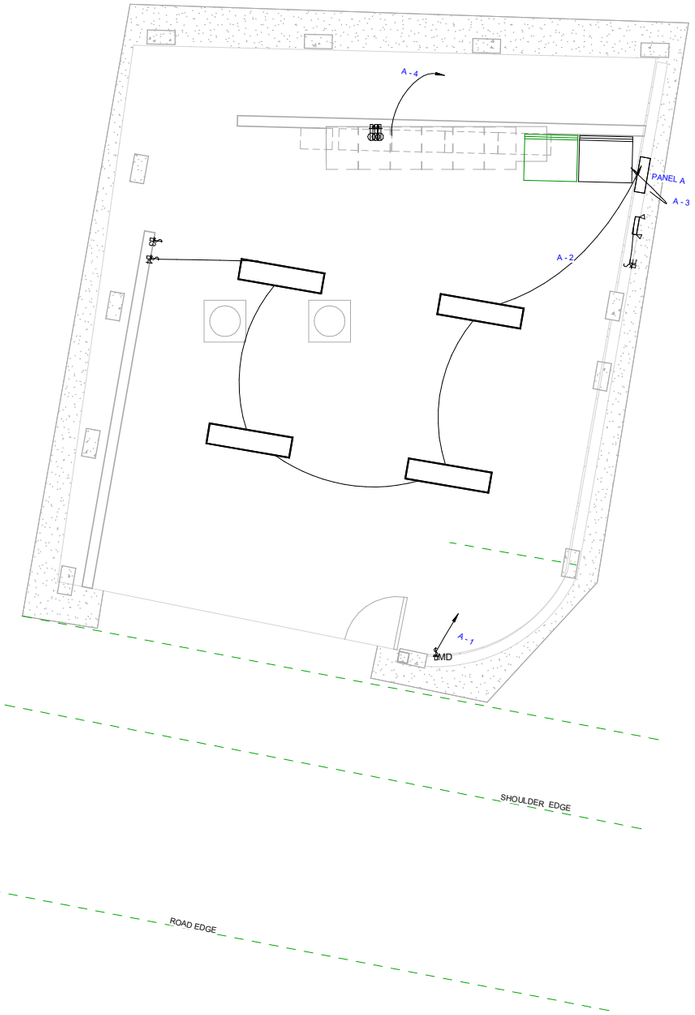
ELECTRICAL GENRAL NOTES

E-000

Scale 1 : 48




1 LIGHTING & POWER PLAN (GARAGE)
1 : 40

| SYMBOL | TYPE | MOUNTING | DESCRIPTION | COUNT |
|---|---|---|---|---|
| | DUPLEX RECEPTACLE | AS INDICATED | SWITCH VOLTAGE 120V, LOAD 180VA | 3 |
| 3 | SMART SWITCH THREE WAY | 4' AFF | SWITCH VOLTAGE 120V | 1 |
| 4 | SMART SWITCH FOUR WAY | 4' AFF | SWITCH VOLTAGE 120V | 1 |
| MD | MOTORIZED DOOR SWITCH | 4' AFF | SWITCH VOLTAGE 120V | 1 |
| E | EMERGENCY SWITCH | 4' AFF | SWITCH VOLTAGE 120V | 1 |

3 ELECTRICAL SCHEDULE (GARAGE)
NTS

| SYMBOL | TYPE | MOUNTING | DESCRIPTION | COUNT |
|---|---|---|---|---|
| | CEILING LIGHT - LINEAR BOX (1'X4') | RECESSED | LIGHTING T-12, VOLTAGE 120V APPARENT POWER 40VA | 4 |
| | 2 HEAD BATTERY LIGHTING UNIT | AS INDICATED | LIGHTING A-19, VOLTAGE 120V APPARENT POWER 100VA | 1 |

2 LIGHTING SCHEDULE (GARAGE)
NTS

0' 2' 4' 8' 16'

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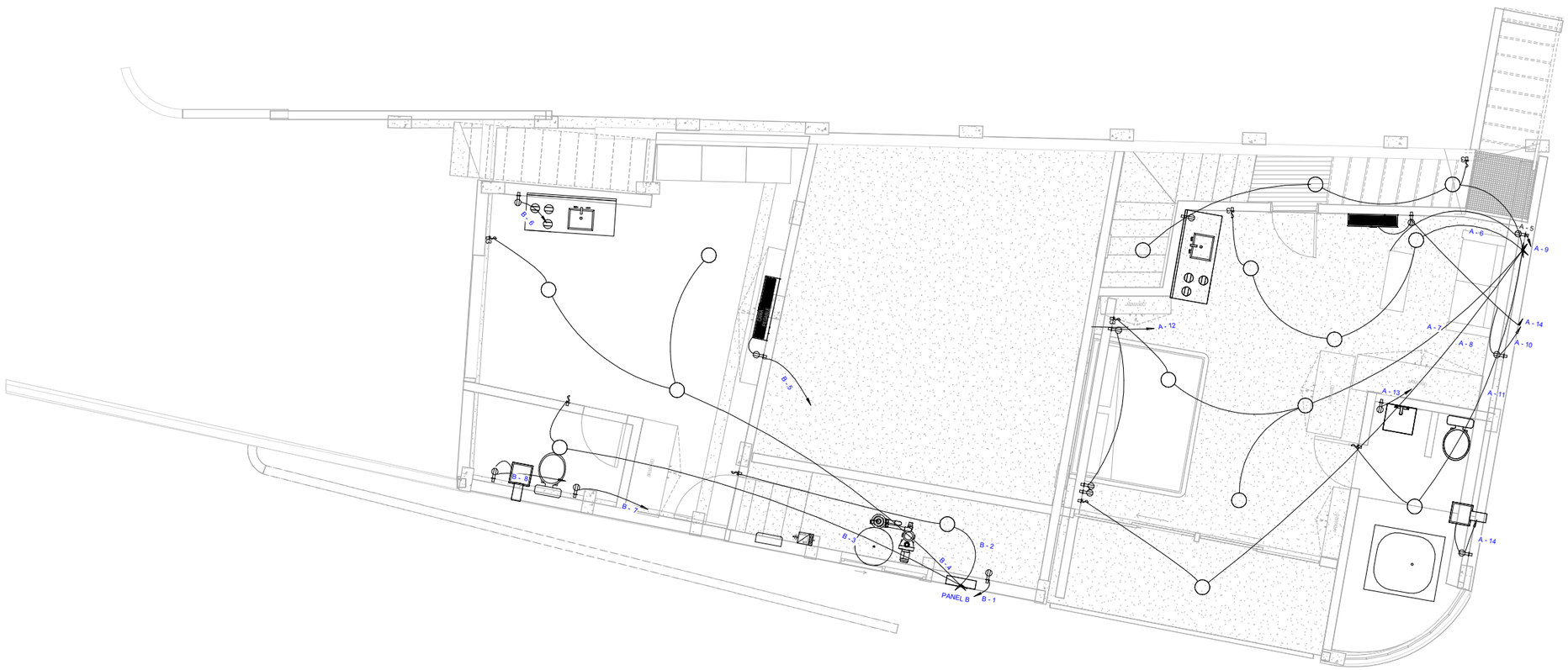
# LIGHING & POWER PLAN 01

E-001

Scale As indicated




LIGHTING & POWER PLAN
(APARTMENT/PUMP ROOM/STAFF ROOM)
1 : 40

| SYMBOL | TYPE | MOUNTING | DESCRIPTION | COUNT |
|---|---|---|---|---|
| | DUPLEX RECEPTACLE | AS INDICATED | SWITCH VOLTAGE 120V, LOAD 180VA | 14 |
| | SMART SWITCH THREE WAY | 4' AFF | SWITCH VOLTAGE 120V | 4 |
| | SMART SWITCH SINGLE POLE | 4' AFF | SWITCH VOLTAGE 120V | 4 |

ELECTRICAL SCHEDULE
(APARTMENT/PUMP ROOM/STAFF ROOM))
NTS

| SYMBOL | TYPE | MOUNTING | DESCRIPTION | COUNT |
|---|---|---|---|---|
| | CEILING LIGHT - FLAT ROUND | RECESSED | LIGHTING 100W, VOLTAGE 120V APPARENT POWER 100VA | 14 |

LIGHTING SCHEDULE
(APARTMENT/PUMP ROOM/STAFF ROOM))
NTS

0' 2' 4' 8' 16'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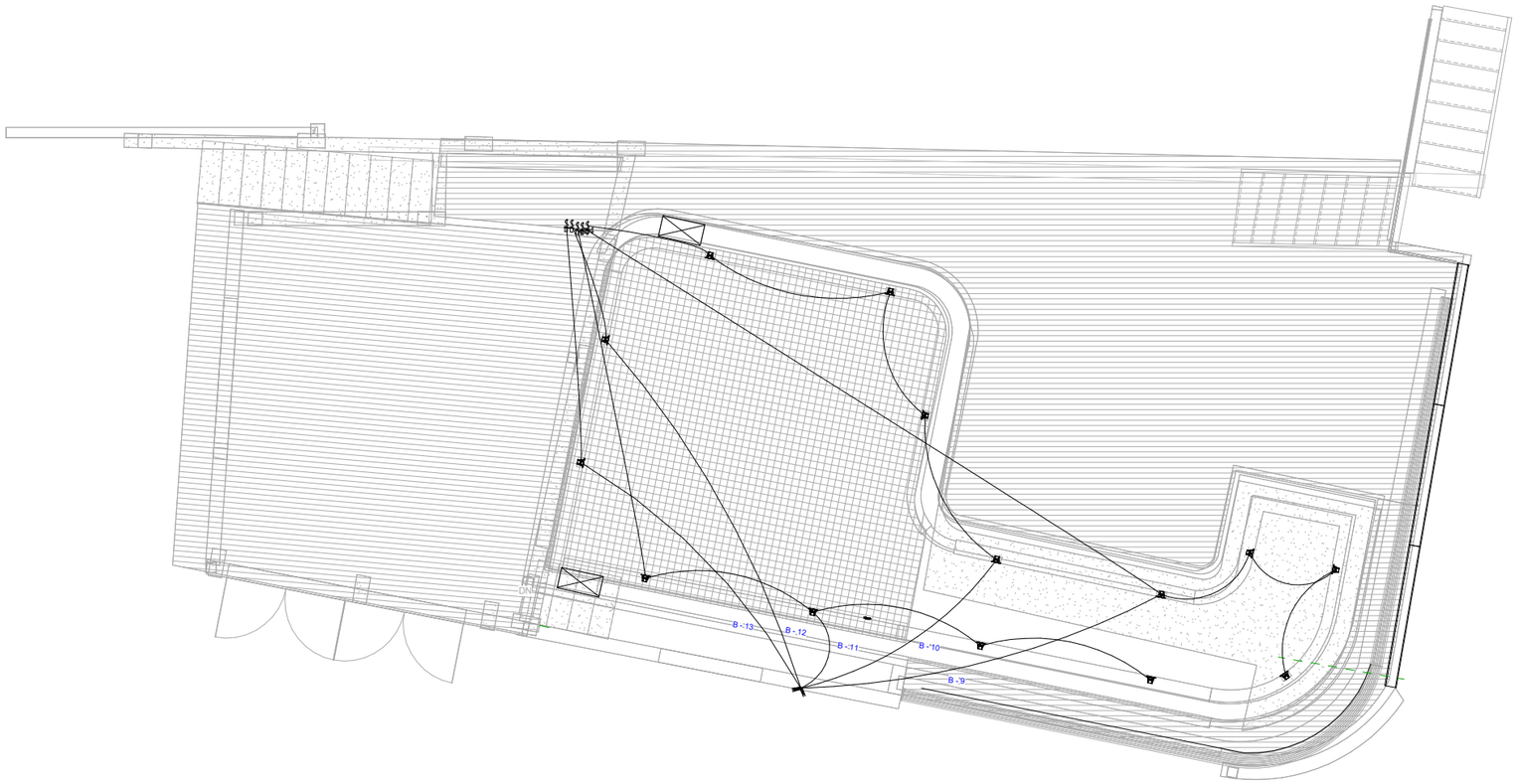
# LIGHTING AND POWER PLAN 02

E-002

Scale: As indicated




LIGHTING & POWER PLAN (POOL/POOL DECK)
1 : 40

| SYMBOL | TYPE | MOUNTING | DESCRIPTION | COUNT |
|---|---|---|---|---|
| | SMART SWITCH THREE WAY | 4' AFF | SWITCH VOLTAGE 120V | 3 |
| | SMART SWITCH SINGLE POLE | 4' AFF | SWITCH VOLTAGE 120V | 2 |

ELECTRICAL SCHEDULE (POOL/POOL DECK)
NTS

| SYMBOL | TYPE | MOUNTING | DESCRIPTION | COUNT |
|---|---|---|---|---|
| | LED DOWNLIGHT | WALL MOUNTED- 4' AFF | LIGHTING LED, VOLTAGE 120V APPARENT POWER 8VA | 14 |

LIGHTING SCHEDULE (POOL/POOL DECK)
NTS

0' 2' 4' 8' 16'

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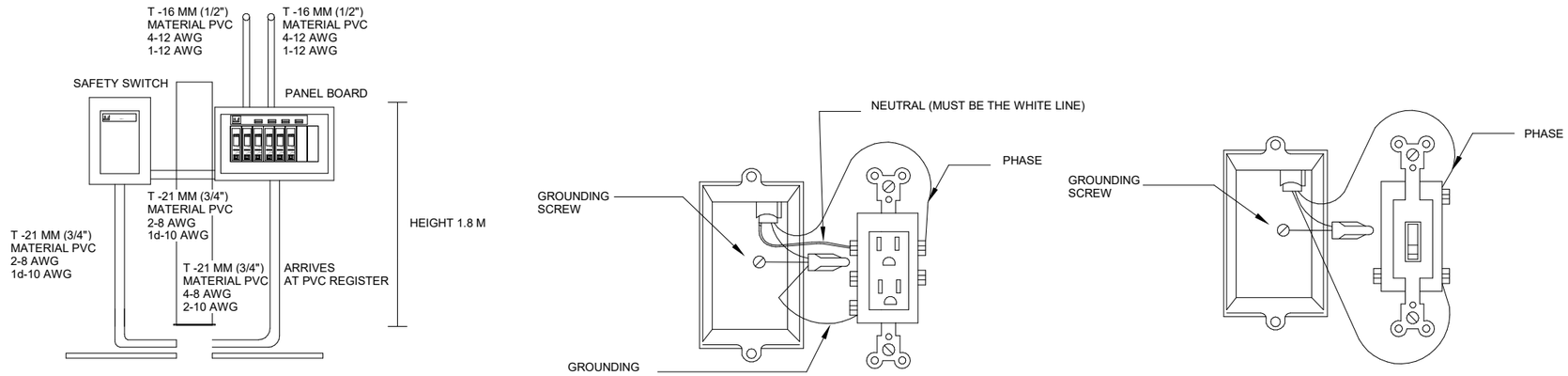
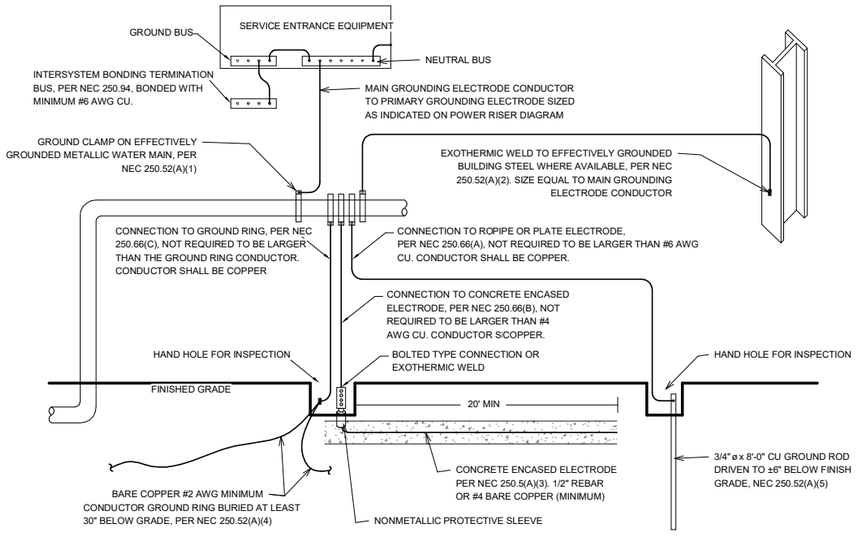
# LIGHTING & POWER PLAN 03

E-003

Scale As indicated

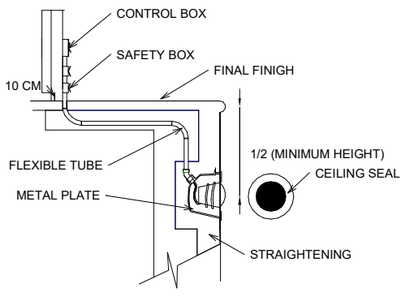



3 TYP. PANEL BOARD DETAILS
NTS

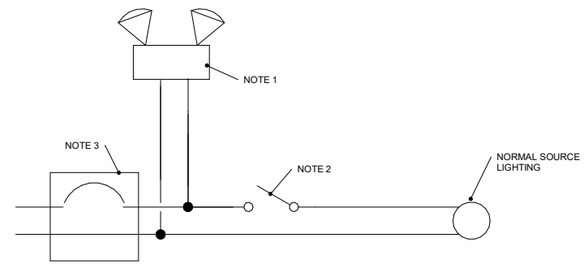



GROUNDING ELECTRODES SHALL BE PROVIDED IN ACCORDANCE WITH NEC SECTION 250. ALL GROUNDING ELECTRODE CONDUCTORS SIZED AS INDICATED ON POWER RISER. ALL METHODS OF CREATING THE GROUNDING SYSTEM MAY NOT BE REQUIRED OR AVAILABLE.

2 TYP. GROUNDING DETAILS
NTS



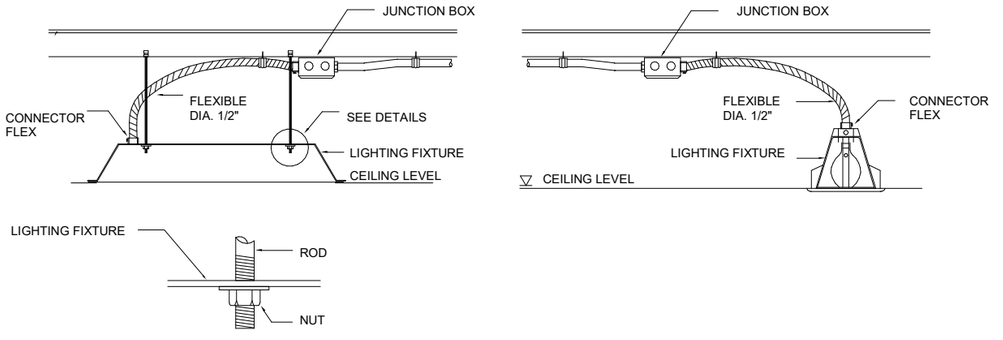

5 TYP. POOL LIGHT
NTS




NOTES

1. SELF CONTAINED UNIT WITH 2 HEAD LIGHT FIXTURE ON THE UNIT TO BE ENERGIZED UPON NORMAL SOURCE FAILURE.
2. LOCAL SWITCH SERVING NORMAL LIGHT.
3. CIRCUIT BREAKER IN NORMAL SOURCE PANELBOARD.

4 EMERGENCY WIRING SCHEMATIC DIAGRAM
NTS




1 TYP. CEILING FLAT & ROUND LIGHT DETAILS
NTS

0' 2' 4' 8' 16'

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# ELECTRICAL DETAILS

E-004

Scale As indicated

# REMANSO VILLA

San Juan Del Sur, Rivas, Nicaragua

## MECHANICAL GENERAL NOTES

1. GENERAL

1.1. THE MECHANICAL WORK SHALL CONFORM TO APPLICABLE STATE AND LOCAL CODES AND THE REQUIREMENTS OF THE AUTHORITIES HAVING JURISDICTION. ALL MECHANICAL WORK SHALL BE PERFORMED BY A CONTRACTOR LICENSED IN THE JURISDICTION OF INSTALLATION. THE CONTRACTOR SHALL HAVE QUALIFICATIONS ANE EXPERIENCE IN INSTALLING MECHANICAL EQUIPMENT. THE CONTRACTOR SHALL FOLLOW ALL MANUFACTUER'S INSTALLATION DOCUMENTATION. NO STRUCTURAL MEMBERS OR COMPONENTSL SHALL BE CUT, NOTCHED, OR OTHERWISE ALTERED FOR THE INSTALLATION OF MECHANICAL EQUIPMENT.

1.2 CONTRACTOR SHALL BE RESPONSIBLE FOR VISITING THE SITE AND VERIFYING ALL EXISTING FIELD CONDITIONS.

1.3 CONTRACTOR IS RESPONSIBLE FOR SUBMITTING SHOP DRAWINGS PRIOR TO THE START OF CONSTRUCTION FOR APPROVAL FOR PERMIT AND/OR CONSTRUCTION. THE SHOP DRAWINGS SHALL INDICATE WORK OF OTHER TRADES AND MUST BE SUBMITTED PRIOR TO FABRICATION AND INSTALLATION FOR APPROVAL FOR PERMIT AND/OR CONSTRUCTION.

1.4 WHERE MORE THAN ONE PRODUCT NAME IS INDICATED, CONSTRUCTION SHALL BE BASED ON ONE OF THE NAMED PdRODUCTS.

A). WHERE USE OF AN 'ACCEPTABLE EQUAL' PRODUCT REQUIRES CHANGES TO THE BASE DESIGN IN ORDER TO INCORPORATE THE PRODUCT INTO THE PROJECT, THE CONTRACTOR SHALL GET APPROVAL PRIOR TO ANY CHANGES.

B). EQUIPMENT SUBSTITUTIONS FOR 'ACCEPTABLE EQUAL' PRODUCTS ARE NOT ALLOWED UNLESS WRITTEN CONSENT IS PROVIDED BY DESIGN ENGINEER.

1.6 THE CONTRACTOR SHALL VERIFY FIELD CONDITIONS FOR POINTS OF CONNECTIONS, CAPACITIES, AND LOCATIONS OF SYSTEMS. ALL REPAIRED FINISHES SHALL MATCH APPROPRIATE ADJACENT FINISHES. FILL VOIDS AROUND DUCTWORK PENETRATING WALLS WITH FIRE STOPPING MATERIAL. FIRE STOPPING MATERIAL SHALL MEET ALL APPLICABLE REGULATORY REQUIREMENTS.

1.7 MECHANICAL EQUIPMENT AND PRODUCTS SHALL BE LISTED AND/OR LABELED BY AN APPROVED TESTING OR INSPECTION AGENCY IN ACCORDANCE WITH LOCAL AND GOVERNING CODE REQUIREMENTS.

1.8 THE DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE GENERAL ARRANGEMENT OF WORK INCLUDED IN THE PROJECT. DO NOT SCALE THE DRAWING. THE CONTRACTOR SHALL ESTABLISH FINAL DIMENSIONS FROM FIELD MEASUREMENTS, PRIOR TO STARTING WORK.

1.9 MECHANICAL WORK SHALL BE COORDINATED WITH THE WORK OF ALL OTHER TRADES PRIOR TO INSTALLATION, TO AVOID CONFLICTS AND ALLOCATE SPACE REQUIREMENTS.

1.10 MATERIALS SHALL BE RATES FOR THE OPERATING TEMPERATURE AND PRESSURE OF THE SYSTEM. MATERIALS SHALL BE SUITABLE FOR THE TYPE OF FLUID IN THE SYSTEM.

1.11 PROJECT PREMISES SHALL BE THOROUGHLY CLEANED AND READY FOR OCCUPANCY INCLUDING ALL FINISHES OF EQUIPMENT PROVIDED AS PART OF THE CONTRACTOR'S WORK.

2. PIPING

2.1 PIPING SHOWN IS SCHEMATIC AND DOES NOT INDICATE EVERY OFFSET, ELBOW, UNION, VALVE, TRAP, ACCESS PANEL, ETC., THAT IS REQUIRED FOR A COMPLETE WORKING SYSTEM. PROVIDE ITEMS AND FITTINGS THAT ARE REQUIRED TO INSTALL THE PIPING SYSTEM WITHIN THE SPACE PROVIDED AND THAT ARE REQUIRED FOR A COMPLETE SYSTEM. PIPING SHALL BE PROPERLY SECURED IN ACCORDANCE WITH MSS STANDARD SP-69.

2.2 MATERIALS SHALL BE RATED FOR THE OPERATING TEMPERATURE AND PRESSURE OF THE SYSTEM. MATERIALS SHALL BE SUITABLE FOR THE TYPE OF FLUID IN THE SYSTEM.

2.3 PIPE SUPPORTS SHALL BE SELECTED AND INSTALLED IN ACCORDANCE WITH THE MSS SP-69 OR LOCAL CODES. UTILIZE TRAPEZE HANGERS FOR PARALLEL RUNS OR PIPING, OTHER THAN SPRINKLER AND WASTE PIPING. COPPER PIPING SYSTEMS SHALL BE SUPPORTED ON COPPER OR COPPER-PLATED SUPPORTS. HANG PIPE FROM BUILDING STRUCTURE THAT IS CAPABLE OF SUPPORTING THE PIPE AND ALL LOAD COMBINATIONS. PIPING SHALL NOT BE HUNG FROM OTHER PIPING. ALL RIGID HANGERS SHALL PROVIDED A MEANS OF VERTICAL ADJUSTMENT AFTER ERECTION. SHIELD SHALL BE PROVIDED BETWEEN HANGERS AND INSULATION.

2.4 WELDING SHALL CONFORM TO CURRENT STANDARDS AND REQUIREMENTS OF THE NATIONAL CERTIFIED PIPE WELDING BUREAU, NFPA 51B, STANDARD FOR FIRE PROTECTION; AND NFPA 241, STANDARD FOR SAFEGUARDING CONSTRUCTION, ALTERATION, AND DEMOLITION OPERATIONS.

2.5 ALL CONDENSATE DRAIN LINES SHALL BE PIPED FULL SIZE OF THE HVAC UNIT DRAIN OUTLET, WITH "P" TRAP, CONNECTED TO PLUMBING AS INDICATED ON DRAWINGS.

3. EQUIPMENT

3.1 ALL MECHANICAL EQUIPMENT SHALL MATCH THE DRAWINGS, SHALL BE NEW, AND SHALL BE PROVIDED BY THE MECHANICAL CONTRACTOR UNLESS OTHERWISE NOTED.

3.2 EQUIPMENT AND PRODUCT MANUFACTURER'S RECOMMENDATIONS AND INSTRUCTIONS FOR INSTALLATION AND OPERATION SHALL BE FOLLOWED IN PERFORMING MECHANICAL WORK, UNLESS OTHERWISE INDICATED OR DIRECTED. MATERIALS AND METHODS USED IN THE WORK SHALL BE COMPATIBLE WITH BUILDING CONDITIONS AND COMPLY WITH THE BUILDING CODE REQUIREMENTS. ALL WORK SHALL BE PERFORMED BY WORKMEN QUALIFIED IN THEIR TRADE.

4. DUCTWORK

4.1 DUCTWORK SHALL BE FABRICATED OF GALVANIZED SHEET METAL WITH CONSTRUCTION AND INSTALLATION IN ACCORDANCE WITH SMACNA STANDARDS AND DUCT SYSTEM REQUIREMENTS. SHEET METAL GAUGES SHALL CONFORM TO THE INTERNATIONAL MECHANICAL CODE (IMC), ASHRAE STANDARDS, AND UL LISTED FIRE RESISTANCE DIRECTORY REQUIREMENTS AS APPLICABLE.

4.2 DUCT COVERINGS, DUCT LININGS, TAPES, AND CORE MATERIAL SHALL HAVE A FLAME SPREAD RATING NOT OVER 25, AND SMOKE DEVELOPMENT NOT OVER 50.

4.3 BEAMS. COLUMNS OR OTHER OBSTRUCTIONS OF THE BUILDING SHALL NOT BE MODIFIED TO ACCOMMODATE THE MECHANICAL SYSTEM INSTALLATION. THE DUCTS SHALL BE TRANSFORMED, DIVIDED OFFSET, RAISED OR LOWERED WITH THE REQUIRED FREE AREA BEING MAINTAINED IN ACCORDANCE WITH SMACNA STANDARDS.

4.4 ALL RECTANGULAR DUCTWORK ELBOWS 30 DEGREE OR GREATER SHALL BE PROVIDED WITH DOUBLE THICKNESS RADIUS TURNING VANES.

4.5 DUCTWORK SIZES SHOWN ARE CLEAR INSIDE DIMENSIONS. FOR INTERNALLY LINED DUCTS, FABRICATE SHEET METAL TO ALLOW FOR THICKNESS OF INSULATION AND MAINTAIN CLEAR DIMENSIONS.

4.6 DUCTWORK SHALL BE SEALED WITH AN DUCT MASTIC OR LIQUID SEALANT FOR DUCTWORK SEALING APPLICATION. EQUAL. DUCT SYSTEM LEAKAGE SHALL CONFORM TO SMACNA "HVAC DUCT LEAKAGE TEST MANUAL" FOR CLASS 2" W.C. SEAL CLASS.A, LEAKAGE CLASS 24 FOR RECTANGULAR DUCTS AND CLASS 12 FOR ROUND DUCTWORK.

4.7 PROVIDE FIRE DAMPERS IN HVAC AIR DISTRIBUTION SYSTEMS THAT PENETRATE FIRE RATED ASSEMBLIES IN ACCORDANCE WITH THE INTERNATIONAL BUILDING AND MECHANICAL CODES. FIRE DAMPERS SHALL BE TYPE B IN ALL DUCTWORK, IN ADDITION TO SECONDARY FIRE DAMPERS FOR CEILING, WALL AND FLOOR MOUNTED AIR DEVICES.

4.8 COORDINATE SPECIFIC FIRE RESISTIVE CONSTRUCTION REQUIREMENTS WITH THE FIRE RATED ASSEMBLIES INDICATED ON ARCHITECTURAL DRAWINGS. THROUGH PENETRATIONS FIRESTOP SYSTEMS SHALL CONFORM TO UL LISTED FIRE RESISTANCE DIRECTORY OR OTHER METHODS ACCEPTABLE TO LOCAL GOVERNING CODE AUTHORITIES.

4.9 PROVIDE FLEXIBLE CONNECTIONS IN ALL DUCTWORK SYSTEMS (SUPPLY, RETURN AND EXHAUST) CONNECTED TO AIR HANDLING UNITS, FANS AND OTHER EQUIPMENT WHICH REQUIRE VIBRATION ISOLATION. FLEXIBLE CONNECTIONS SHALL BE PROVIDED AT THE POINT OF CONNECTION TO THE EQUIPMENT UNLESS OTHERWISE INDICATED.

4.10 PROVIDE ACCESS DOORS IN DUCTWORK TO PROVIDE ACCESS FOR ALL SMOKE DETECTORS, FIRE DAMPERS. SMOKE DAMPERS, VOLUME DAMPERS, COILS, AND OTHER ITEMS LOCATED IN THE DUCTWORK WHICH REQUIRE SERVICE AND/ OR INSPECTION. LABEL ACCESS WITH 1/2" LETTERING. LL NEW LIGHTING FIXTURES SHALL BE INSTALLED COMPLETE WITH LAMP BULBS. SEE LIGHTING FIXTURE SCHEDULE FOR LAMP BULBS AN

5. INSULATION

5.1 INSULATION MATERIALS SHALL BE CERTAIN-TEED OR APPROVED EQUAL INSULATION MATERIALS SHALL HAVE A FLAME SPREAD RATING NOT MORE THAN 25 AND A SMOKE DEVELOPED RATING OF NOT MORE THAN 50. INSTALL IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND AS FOLLOWS:

5.2 SIZE OF ALL PIPING AND DUCT INSULATION SHALL MEET STATE ENERGY CODE.

6. DUCT INSULATION

6.1. SUPPLY/RETURN AIR DUCTWORK (CONCEALED): INSULATE WITH NOMINAL 1-INCH-THICK TYPE 75 STANDARD DUCTWRAP WITH FSK FACING VAPOR BARRIER. MINIMUM 3/4-INCH INSTALLED THICKNESS WITH A 5.6 R VALUE.

6.2. SUPPLY/RETURN AIR DUCTWORK (INTERIOR EXPOSED WHERE INDICATED): INSULATE WITH 1-INCH-THICK TYPE 200 ULTRA-LITE ACOUSTICAL DUCT LINER WITH 100 PERCENT ADHESIVE COVERAGE AND MECHANICAL FASTENERS. MINIMUM INSTALLED R VALUE OF 3.1.

6.3. SUPPLY/RETURN AIR DUCTS (CONCEALED IN ATTIC/CRAWL/ROOF CEILING SPACE): INSULATE WITH NOMINAL 3-INCH-THICK TYPE 75 STANDARD DUCTWRAP WITH FSK FACING, VAPOR BARRIER. MINIMUM 2-1/4-INCH INSTALLED THICKNESS WITH 8.5 R VALUE.

6.4. SUPPLY/RETURN/EXHAUST/OUTSIDE AIR DUCTS (OA DUCTWORK & DUCTWORK EXPOSED TO WEATHER CONDITIONS): INSULATE DUCTWORK EXTERIOR WITH SEMI-RIGID FIBERGLASS BOARD INSULATION, TYPE 1B300, 3.0 LBS/CU. FT. DENSITY, MINIMUM 2-INCH INSTALLED THICKNESS WITH 8.5 R VALUE. PROVIDE WEATHERPROOF FINISH AS MANUFACTURED BY FOSTERS MONOLAR 60 -95 COATINGS (MINIMUM OF 3 COATS) OR APPROVED EQUAL.

6.5. PROVIDE ALL NECESSARY FOUNDATIONS, SUPPORTS, PADS AND BASES AS REQUIRED FOR MECHANICAL EQUIPMENT, PIPING, AND DUCTWORK AS PER INTERNATIONAL BUILDING AND MECHANICAL CODES. INSTALL EQUIPMENT, PIPING, AND DUCTWORK SO AS TO BE FREE FROM OBJECTIONABLE NOISE AND VIBRATIONS. CONTRACTOR SHALL COORDINATE WORK WITH STRUCTURAL AND ARCHITECTURAL DRAWINGS PRIOR TO ACTUAL WORK.

7. ACOUSTIC LINING

7.1 ACOUSTICAL INSULATION ADHESIVE, MASTICS AND RELATED MATERIAL SHALL BE OF NON-COMBUSTIBLE MATERIALS TO MEET CODE AND WITH UL FLAME SPREAD RATING OF 25 MAXIMUM AND SMOKE DEVELOPED RATING OF 50 MAXIMUM.

7.2 PROVIDE INTERNAL DUCT INSULATION FOR A MINIMUM 15 FEET UPSTREAM AND DOWNSTREAM OF AIR HANDLERS AND FANS, AND WHERE INDICATED ON THE DRAWINGS. APPLY INSULATION ON ALL INTERIOR SURFACES.

7.3 ALL DUCT SIZES ARE INTERNAL DIMENSIONS. CONTRACTOR SHALL INCREASE SHEET METAL SIZE IF DUCT RECEIVES INTERNAL LINER.
8. ELECTRICAL WORK

8.1 ELECTRIC MOTORS FOR MECHANICAL EQUIPMENT SHALL BE PROVIDED UNDER THE MECHANICAL WORK UNLESS OTHERWISE NOTED. ALL MOTORS SHALL BE NEMA STANDARD DESIGN FOR QUIET OPERATION AND SIZED TO PROPERLY OPERATE EQUIPMENT AT RATED LOAD. MOTORS WITH BELT DRIVES SHALL BE PROVIDED WITH ADJUSTABLE PULLEYS AND SHAFTS. ELECTRICAL POWER CONNECTIONS FOR MECHANICAL EQUIPMENT SHALL BE PROVIDED UNDER THE ELECTRICAL WORK. ALL SAFETY COVERS AND PROTECTION FOR MOVING PARTS SHALL BE INSTALLED PER MANUFACTUER'S REQUIREMENTS.

8.2 MOTOR STARTERS, RELAYS, AND CONTACTORS SHALL BE FURNISHED UNDER THE MECHANICAL WORK AND INSTALLED AND POWERED UNDER THE ELECTRICAL WORK. STARTERS, RELAYS. AND CONTACTORS SHALL BE COMPUTE WITH LUGS SIZED FOR SPECIFIED CONDUCTORS AND INCLUDE REQUIRED ACCESSORIES (I.E. START-STOP PUSH BUTTON, PILOT LIGHTS, H.O.A. SWITCH, AUXILIARY CONTACTS AND OVERLOAD PROTECTION). GENERAL PURPOSE NEMA TYPE 1 ENCLOSURES INDOORS, NEMA TYPE 3R ENCLOSURES OUTDOORS. SINGLE PHASE MOTOR STARTERS SHALL BE MANUAL TYPE WITH OVERLOAD PROTECTION, UNLESS OTHERWISE NOTED. THREE PHASE STARTERS SHALL BE MAGNETIC FULL VOLTAGE, NONREVERSING, UNLESS OTHERWISE NOTED. STARTERS FOR MECHANICAL SYSTEMS SHALL BE AS MANUFACTURED BY SQUARE-D, GENERAL ELECTRIC, OR CUTLER HAMMER. STARTERS SHALL CONFORM TO NEMA STANDARDS AND NATIONAL ELECTRICAL CODE (NEC) REQUIREMENTS. STARTER CONTROL AND INTERLOCK WIRING SHALL BE PROVIDED UNDER THE MECHANICAL WORK. ALL EQUIPMENT SHALL BE FURNISHED W/ MANUFACTURER PROVIDED DISCONNECT SWITCH.

8.3 DUCT SMOKE DETECTORS SHALL BE INSTALLED IN ALL AIR DISTRIBUTION SYSTEMS WITH A DESIGN CAPACITY OF 2000 CFM OR GREATER IN ACCORDANCE WITH THE INTERNATIONAL MECHANICAL CODE SECTION 606 AND NATIONAL FIRE PREVENTION CODE NFPA 72 AND 90A. DUCT SMOKE DETECTORS SHALL BE "DUAL CONTAC"' TYPE (FOR TIE-IN TO FIRE ALARM SYSTEM AND FOR FAN SHUT-DOWN). COMPLETE WITH SAMPLING TUBE, REMOTE RESET, REMOTE PILOT INDICATOR (FOR CONCEALED APPLICATIONS), UL LISTED FOR INTENDED USE AND COMPLETELY COMPATIBLE WITH FIRE ALARM SYSTEM. DUCT SMOKE DETECTORS SHALL BE FURNISHED AND INSTALLED UNDER THE MECHANICAL WORK AND WIRED AND POWERED UNDER THE ELECTRICAL WORK.

9 CONTROLS

9.1 PROVIDE AUTOMATIC TEMPERATURE CONTROL SYSTEM(S) FOR HVAC EQUIPMENT UNDER MECHANICAL WORK. CONTROL DEVICES SHALL BE PROVIDED BY UNIT MANUFACTURER, UNLESS OTHERWISE NOTED. HVAC EQUIPMENT NOT PROVIDED WITH CONTROL DEVICES SHALL BE PROVIDED WITH DEVICES AS MANUFACTURED TO MATCH BASE BUILDING CONTROLS. CONTROL WIRING SHALL BE PROVIDED IN ACCORDANCE WITH THE NEC FOR 24-VOLT CONTROL SYSTEM(S). WIRING SHALL BE A MINIMUM 22 AWG, COLOR CODED AND INSTALLED IN CONDUIT WHERE SUBJECT TO PHYSICAL DAMAGE OR WHERE REQUIRED TO AVOID PLENUM SPACES. EXTEND ALL LOW VOLTAGE WIRING UNBROKEN BETWEEN EACH CONTROL DEVICE AND EQUIPMENT TERMINAL STRIP. INSTALLATION OF CONTROL SYSTEM(S), WIRING. AND DEVICES SHALL BE BY A CERTIFIED CONTROLS CONTRACTOR LICENSED TO PERFORM THE INSTALLATION.

9.2 UNLESS OTHERWISE INDICATED, ALL THERMOSTATS SHALL BE MOUNTED IN ACCORDANCE WITH ADA REQUIREMENTS.

10. TOXIC MATERIAL

10.1 IN THE EVENT THE CONTRACTOR ENCOUNTERS ON THE SITE MATERIAL REASONABLY BELIEVED TO BE ASBESTOS, POLYCHLORINATED BIPHENYL (PCB) OR OTHER TOXIC MATERIAL, WHICH HAS NOT BEEN RENDERED HARMLESS, THE CONTRACTOR SHALL IMMEDIATELY STOP WORK IN THE AREA AFFECTED, SEAL OFF THE PERIMETER, AND REPORT THE CONDITION TO THE OWNER IN WRITING. NO NEW BUILDING MATERIAL SHALL CONTAIN ASBESTOS, POLYCHLORINATED BIPHENYL (PCB) OR OTHER TOXIC MATERIAL AS DEFINED BY STATE AND FEDERAL REGULATORY AGENCIES.

11. AIR BALANCING

11.1 UPON COMPLETION OF HVAC INSTALLATION MECHANICAL CONTRACTOR SHALL EMPLOY INDEPENDENT AIR BALANCING CONTRACTOR TO TEST AND ADJUST SYSTEM(S) AND PREPARE AN AIR BALANCING REPORT ON SYSTEMS PERFORMANCE. AIR BALANCING REPORT SHALL CONFORM TO REQUIREMENTS OF THE ASSOCIATION AIR BALANCING COUNCIL STANDARDS. SIX COPIES OF THE REPORT SHALL BE SUBMITTED FOR REVIEW AND APPROVAL.

## SYMBOLS

- 12X10 — NEW DUCT (1ST DIMENSION INDICATES SIDE SHOWN, INSIDE CLEAR DIMENSIONS)
- DUCT SIZE TRANSITION
- RECTANGULAR/SQUARE DUCT TO ROUND DUCT SIZE TRANSITION
- FLEX DUCT
- MANUAL VOLUME DAMPER
- BACKDRAFT DAMPER
- AUTOMATIC (MOTORIZED) VOLUME DAMPER/ SMOKE DAMPER
- **FIRE** DAMPER
- SUPPLY DUCT TO RISE **UP**
- SUPPLY DUCT TO DROP **DOWN**
- RETURN DUCT TO RISE **UP**
- RETURN DUCT TO DROP **DOWN**
- SUPPLY AIR DEVICE
- RETURN OR EXHAUST AIR DEVICE
- DUCT WITH DUCT BRANCH
- DUCT WITH ROUND DUCT TAKE-OFF
- DUCT WITH CAPPED END
- EXISTING TO NEW CONNECTION
- CEILING MOUNTED EXHAUST FAN
- AHU 1 — UNIT TAG TYPE UNIT DESIGNATED NUMBER
- T — THERMOSTAT
- S — SWITCH
- SD — DUCT SMOKE DETECTOR
- U — DOOR UNDERCUT
- 2'X2' SUPPLY DIFFUSER
- 2'X2' RETURN GRILLE
- 2'X2' EXHAUST GRILLE
- S1 / 100 — DIFFUSER TAG TYPE AIR CFM (CUBIC FEET PER MINUTE)
- R1 / 100 — GRILLE TAG TYPE AIR CFM (CUBIC FEET PER MINUTE)

## ABBREVIATIONS

| | |
|---|---|
| AF | AIR FILTER |
| AFF | ABOVE FINISHED FLOOR |
| ACU | AIR CONDITIONING UNIT |
| AHU | AIR HANDLING UNIT |
| APD | AIR PRESSURE DROP |
| ARCH | ARCHITECTURAL |
| BDD | BACKFRAFT DAMPER |
| BPD | BYPASS DAMPER |
| BLW | BELOW |
| BTUH | BRITISH THERMAL UNIT PER HOUR |
| CFM | CUBIC FEET PER MINUTE |
| CLG | CEILING |
| CU | CONDENSING UNIT |
| CW | COLD WATER |
| DB | DRY BULB |
| DDC | DIRECT DIGITAL CONTROL |
| DIA | DIAMETER |
| DI | DIGITAL INPUT |
| DN | DOWN |
| DO | DAMPER OPERATOR |
| DO | DIGITAL OUTPUT |
| DPS | DIFFERENTIAL PRESSURE SWITCH |
| DWG | DRAWING |
| DX | DIRECT EXPANSION |
| (E) | EXISTING |
| EA | EACH |
| EAT | ENTERING AIR TEMPERATURE |
| EF | EXHAUST FAN |
| EQUIP | EQUIPMENT |
| ESP | EXTERNAL STATIC PRESSURE |
| EXT | EXTERNAL |
| F | DEGREE FAHRENHEIT |
| FD | FIRE DAMPER |
| FL | FLOOR |
| FPM | FEET PER MINUTE |
| FT | FEET |
| GALV | GALVANIZED |
| HC | HEATING COIL |
| HP | HEAT PUMP |
| HW | HOT WATER |
| IN | INCH |
| IN. WG. | INCH WATER GAUGE |
| KW | KILOWATT |
| LAT | LEAVING AIR TEMPERATURE |
| LB | POUNDS |
| LF | LINEAR FEET |
| MAX | MAXIMUM |
| MBH | 1000 BTUH |
| MECH | MECHANICAL |
| MER | MECHANICAL EQUIPMENT ROOM |
| MIN | MINIMUM |
| MOT | MOTORIZED |
| NC | NOISE CRITERIA |
| NC | NORMALLY CLOSED |
| NIC | NOT IN CONTRACT |
| NO | NORMALLY OPEN |
| NOM | NOMINAL |
| No. | NUMBER |
| O.A. | OUTSIDE AIR |
| OAT | OUTSIDE AIR TEMPERATURE |
| OED | OPEN END DUCT |
| PD | PRESSURE DROP |
| PS | PRESSURE SENSOR |
| PSI | POUND PER SQUARE INCH |
| RA | RETURN AIR |
| RAT | RETURN AIR TEMPERATURE |
| REFRIG | REFRIGERANT |
| RLA | RUNNING LOAD AMPERE |
| RPM | REVOLUTION PER MINUTE |
| SA | SUPPLY AIR |
| SAT | SUPPLY AIR TEMPERATURE |
| SD | SMOKE DETECTOR |
| SF | SUPPLY FAN |
| STRUC | STRUCTURAL |
| TD | TRANSFER DUCT |
| TS | TEMPERATURE SENSOR |
| TYP | TYPICAL |
| UNO | UNLESS NOTED OTHERWISE |
| W | WATT |
| WB | WET BULB |
| WC | WATER COLUMN |
| WMC | WIRE MESH SCREEN |
| WPD | WATER PRESSURE DROP |

0' 2' 4' 8' 16'


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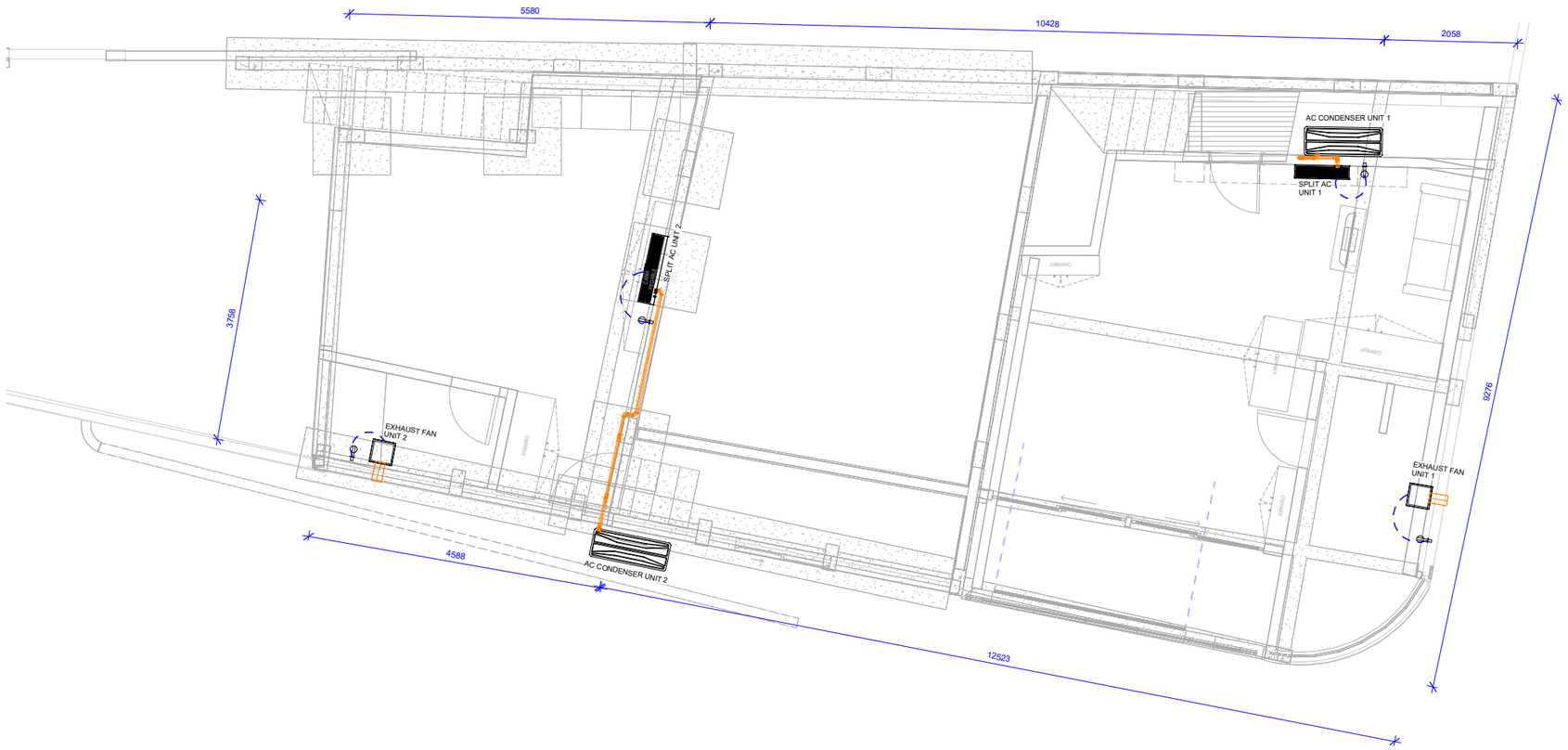
| Project number | **01** | Date | **14/05/25** |
| Drawn by | **Author** | Checked by | **Checker** |

MECHANICAL GENERAL NOTE

M-000

Scale 1 : 1




1 MECHANICAL LAYOUT PLAN
1 : 40

| TYPE | AIR FLOW |
|---|---|
| AIR CONDITIONER & CONDENSER (UNIT 1) | 700 CFM |
| AIR CONDITIONER & CONDENSER (UNIT 2) | 700 CFM |
| EXHAUST FAN (UNIT 1) | 150 CFM |
| EXHAUST FAN (UNIT 1) | 150 CFM |

3 AIR CONDITIONER & EXHAUST FAN DETAILS
1 : 20

| MECHANICAL LEGEND | |
|---|---|
| MECHANICAL OUTLET | |
| POWER LINE | |

0' 2' 4' 8' 16'

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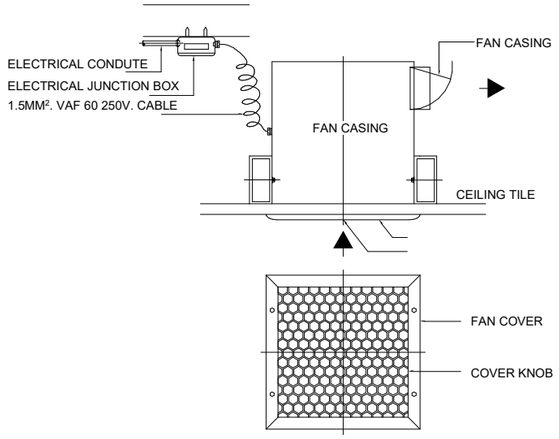
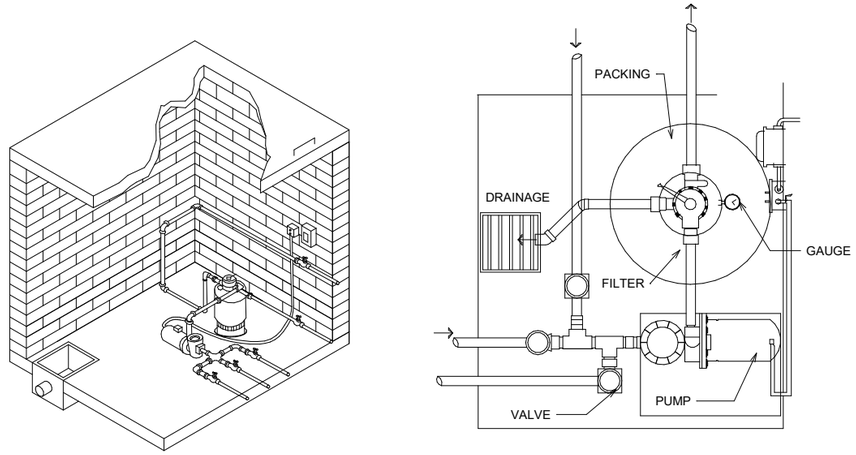
# MECHANICAL LAYOUT PLAN

M-001

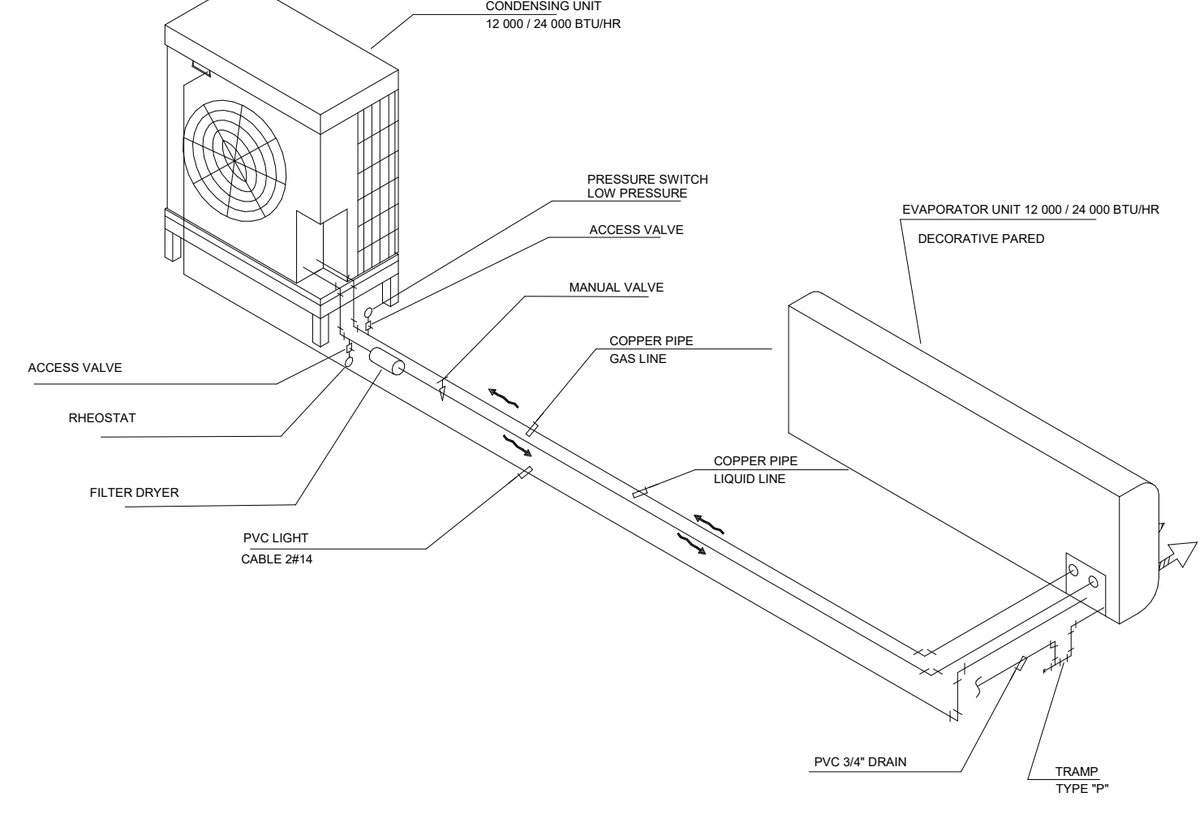
Scale As indicated




2 EXHAUST FAN DETAILS
NTS




3 TYP. POOL FILTERING SYSTEM
NTS




1 SPLIT AIR CONDITIONER DETAILS
NTS

0' 2' 4' 8' 16'

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# MECHANICAL DETAILS

M-002

Scale As indicated