Hot Tub Circuit Permit Packet

123 Sample St

JOB	CONTRACTOR	CHECKLIST
2,400 sq ft home Parcel 000-00-000-000 Hot tub, outdoor Customer: Sample Homeowner	Sample Electric, LLC License ROC 000000	Oro Valley, AZ General checklist, city rules added in setup

Checklist

Required	In this packet	Status
Permit application	Page 2: fields ready for the city's form	**Ready**
Site plan showing the panel and the appliance	Page 3: to scale, 1 in = 40 ft	**Ready**
One-line diagram with conductors, breaker and disconnect	Page 4	**Ready**
Load calculation	Page 5	**Ready**
Manufacturer specifications and listing	Page 6: add manufacturer sheets	**Attach**

Engineering checks

Check	Result	Status
Service capacity	150.3 A computed on the 200 A service	**Pass**
Panel spaces	4 open, 2 needed	**Pass**
Breaker	50 A for a 40 A continuous load	**Pass**
Conductors	#6 Cu THWN-2, 55 A at 60°C	**Pass**
Voltage drop	1.6 V, 0.7% over 40 ft	**Pass**
Conduit fill	4 wires in 3/4" PVC, 40% fill	**Pass**
GFCI protection	Listed spa pack (680.44)	**Pass**
Disconnect distance	8 ft from the spa, 5 ft minimum	**Pass**

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Flagged for your review

[ ] Check the existing loads against the home. They drive the service result.

[ ] Call 811 before trenching. Confirm 18 in of cover for PVC (300.5).

[ ] Wire sized at the 60°C column. Confirm the equipment's terminal rating (110.14(C)).

[ ] Bond the spa's metal parts and equipment per the manufacturer and 680.42/680.26.

[ ] Keep receptacles at least 6 ft from the spa, and GFCI-protect any within 20 ft (680.43).

[ ] Check overhead line clearances above the spa (680.9).

[ ] The disconnect must be within sight of the spa.

[ ] Confirm the adopted code edition.

Permit Application Data

Prepared for transfer to the city's permit application. This page is not the city's form.

Project address	123 Sample St
Parcel number	000-00-000-000
Jurisdiction	Oro Valley, AZ
Property owner	Sample Homeowner
Permit type	Electrical, residential hot tub circuit
Hot tub	Add make and model
Contractor	Sample Electric, LLC
License number	ROC 000000

Scope of work

Install one dedicated 240 V, 50 A circuit for a hot tub at the outdoor. Add a 50 A, 2-pole breaker to the existing 200 A main panel. Trench about 25 ft and run a new 40 ft branch circuit, 3 #6 Cu THWN-2 + #10 EGC, in 3/4" PVC conduit, from the main panel to a new disconnect, then to the appliance. No service upgrade.

Inspection plan

Stage	What's inspected
Underground	Open trench, conduit and burial depth, before backfill
Rough	Circuit wiring, conduit, grounding and bonding, before covering
Final	Breaker, disconnect, appliance, labeling, and manufacturer instructions on site

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Site Plan

123 Sample St. Parcel 000-00-000-000.



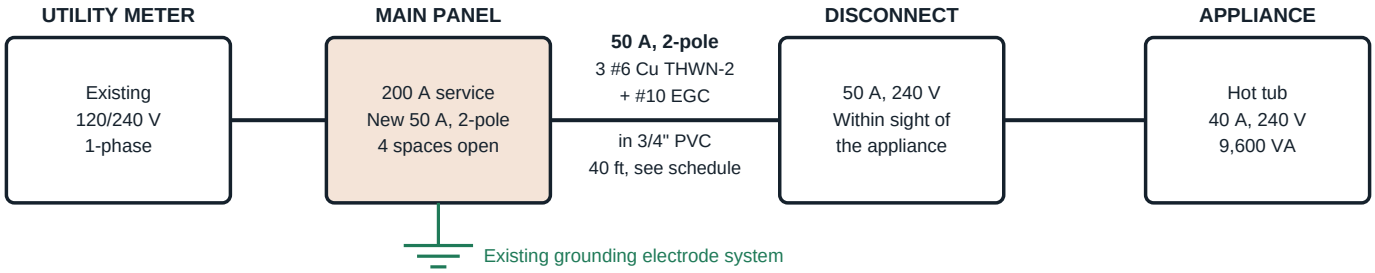
P Main panel, 200 A (existing)
A Hot tub, 40 A (new)
New circuit underground, 35 ft measured on plan
Dashed yellow: lot line

Wire run with rises: 40 ft
Underground: 25 ft (dashed on the plan)
Hot tub to nearest lot line: 7 ft
Scale 1 in = 40 ft when printed at 100%
Not a survey. Field verify all dimensions.

Lot lines: Pima County GIS. Map services and data available from U.S. Geological Survey, National Geospatial Program.

One-Line Diagram

Main panel, breaker, disconnect, conductors and the appliance.



Conductor and conduit schedule

Segment	Conductors	Conduit	Protection
Branch circuit	3 #6 Cu THWN-2 + #10 EGC	3/4" PVC	50 A, 2-pole

Circuit schedule

Item	Specification	Basis
Hot conductors	2 #6 Cu THWN-2, 55 A at 60°C	Carries the 50 A breaker, within the 240.4(D) limit
Neutral	#6 Cu THWN-2	Neutral for the appliance's 120 V part
Equipment ground	1 #10 Cu	Table 250.122, no larger than the hots
Conduit and fill	3/4" PVC, 4 wires, 40% fill	Chapter 9 Table 4
Breaker	50 A, 2-pole	Matched to the main panel
Run	40 ft one way	Field verify
Trench and cover	25 ft underground, 18 in cover for PVC (300.5)	Confirm for the wiring method used
Voltage drop	1.6 V, 0.7% at 40 A	Within 3%
Terminal rating	Sized at the 60°C column	110.14(C)

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Load Calculation

Optional dwelling method, NEC 220.82, with the hot tub added at 100% of nameplate. Confirm the method the city accepts.

Load	Basis	VA
General lighting	2,400 sq ft x 3 VA	7,200
Small appliance circuits	2 x 1,500 VA	3,000
Laundry circuit	1 x 1,500 VA	1,500
Range	Nameplate	12,000
Dryer	Nameplate	5,000
Water heater	Nameplate	4,500
Subtotal		**33,200**
First 10,000 VA	100%	10,000
Remainder	23,200 VA x 40%	9,280
Air conditioning	Larger of heating or cooling, 100%	7,200
Hot tub	40 A x 240 V, 100%	9,600
Total calculated load		**36,080**

Computed load	**36,080 VA / 240 V = 150.3 A**
Existing service	200 A, 75% used by this load
Spare capacity	49.7 A on the 200 A service
Hot tub circuit	40 A, 50 A breaker

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Equipment Data

Attach the manufacturer's data sheets and listing information behind this page.

Item	Specification	Listing
Hot tub	Add make and model	Attach the manufacturer's installation instructions and NRTL listing
Nameplate data used	Nameplate 40 A at 240 V	From the nameplate
Breaker	50 A, 2-pole, matched to the main panel	Listed for the panel
Branch conductors	3 #6 Cu THWN-2 + #10 EGC, 3/4" PVC	Listed, NEC 310.16
GFCI protection	Listed spa pack	NEC 680.44
Disconnect	Within sight of the spa, 8 ft away	NEC 680.13

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Pre-Submittal Review

Complete before sending this packet to the city.

Item	Reviewed by	Done
Existing loads match the home	Electrician	[ ]
Open spaces in the main panel	Electrician	[ ]
Breaker matches the nameplate	Electrician	[ ]
Equipment terminal rating confirmed, 60°C column	Electrician	[ ]
Route and trench depth	Electrician	[ ]
Spa bonding done to the manufacturer's instructions	Electrician	[ ]
GFCI protection and disconnect distance	Electrician	[ ]
Equipment data attached	Electrician	[ ]
Code edition confirmed with the city	Electrician	[ ]

Approval

Reviewed by	
Signature	
Date	

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