Subpanel Permit Packet

123 Sample St

JOB	CONTRACTOR	CHECKLIST
2,400 sq ft home Parcel 000-00-000-000 100 A subpanel, detached building 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 main panel, subpanel and feeder route	Page 3: to scale, 1 in = 40 ft	**Ready**
One-line diagram with feeder conductors, EGC and grounding	Page 4	**Ready**
Load calculation	Page 6	**Ready**
Panel specifications and listing	Page 7: add manufacturer sheets	**Attach**

Engineering checks

Check	Result	Status
Service capacity	137.8 A computed on the 200 A service	**Pass**
Panel spaces	4 open, 2 needed	**Pass**
Feeder breaker	100 A breaker on a 100 A subpanel	**Pass**
Feeder conductors	2 #3 Cu + #3 neutral + #8 EGC, 100 A at 75°C	**Pass**
Feeder load	27.5 A of 100 A	**Pass**
Voltage drop	1.2 V, 0.5% over 90 ft	**Pass**
Conduit fill	4 wires in 1" PVC, 40% fill	**Pass**

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Flagged for your review

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

[ ] A detached building needs its own grounding electrode (250.32(A)) and a disconnect at the building (225.31). The subpanel's main breaker can serve as the disconnect.

[ ] Keep neutral and ground separate in the subpanel. No neutral-to-ground bond (250.24(A)(5)).

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

[ ] Confirm the breaker and panel terminals are rated 75°C (110.14(C)).

[ ] Keep the working space in front of both panels clear: 30 in wide, 36 in deep (110.26).

[ ] New branch circuits in the subpanel need GFCI and AFCI protection where required (210.8, 210.12).

[ ] 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 subpanel and feeder
Subpanel	Add make and model, 100 A
Contractor	Sample Electric, LLC
License number	ROC 000000

Scope of work

Install one 100 A, 120/240 V subpanel at the detached building. Add a 100 A, 2-pole breaker to the existing 200 A main panel. Trench about 70 ft and run a new 90 ft feeder, 2 #3 Cu + #3 neutral + #8 EGC, in 1" PVC conduit, from the main panel to the subpanel. Ground the building with its own grounding electrode and a disconnect at the building. Keep neutral and ground separate in the subpanel. No service upgrade.

Inspection plan

Stage	What's inspected
Underground	Open trench, conduit and burial depth, before backfill
Rough	Feeder, subpanel enclosure, grounding and bonding, before covering
Final	Subpanel, breakers, labeling, and working space on site

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Site Plan

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



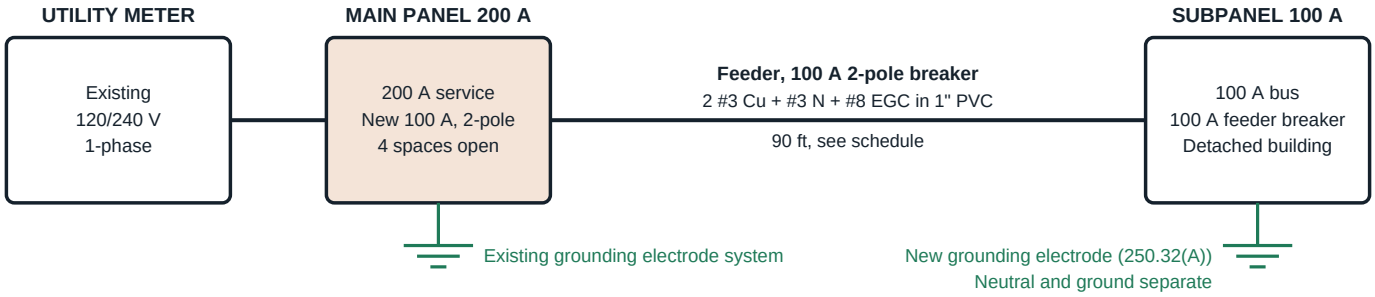
P Main panel (existing)
S Subpanel, 100 A (new)
Feeder route, 85 ft measured on plan
Dashed yellow: lot line

Feeder run: 90 ft
Underground: 70 ft (dashed on the plan)
Subpanel to nearest lot line: 20 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, feeder conductors, subpanel and grounding.



Conductor and conduit schedule

Segment	Conductors	Conduit	Protection
Feeder	2 #3 Cu + #3 neutral + #8 EGC	1" PVC	100 A, 2-pole
Grounding electrode	Electrode per 250.52, GEC per 250.66	As required (250.64)	Listed clamp or weld (250.70)

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Feeder Schedule

Conductors, conduit, run, cover and voltage drop for the feeder to the subpanel.

Item	Specification	Basis
Phase conductors	2 #3 Cu THWN-2, 100 A at 75°C	100 A breaker (240.4)
Neutral	1 #3 Cu THWN-2, full size	Same size as the hots
Equipment ground	1 #8 Cu	Table 250.122
Conduit and fill	1" PVC, 4 wires, 40% fill	Chapter 9 Table 4
Run	90 ft one way	Field verify
Trench and cover	70 ft underground, 18 in cover for PVC (300.5)	Confirm for the conduit type used
Voltage drop	1.2 V, 0.5% at 27.5 A	Within 3%
Terminal rating	Breaker and panel terminals rated 75°C	110.14(C)

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Load Calculation

Optional dwelling method, NEC 220.82, with the subpanel loads 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
Shop circuits	Subpanel, 100% of nameplate	3,000
Mini-split	Subpanel, 100% of nameplate	3,600
Total calculated load		**33,080**

Computed load	**33,080 VA / 240 V = 137.8 A**
Existing service	200 A, 69% used by this load
Spare capacity	62.2 A on the 200 A service
Subpanel feeder load	27.5 A from the loads listed

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Equipment Data

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

Item	Specification	Listing
Subpanel	Add make and model, 100 A bus, 100 A feeder breaker	Attach manufacturer data and NRTL listing
Feeder breaker	100 A, 2-pole, matched to the main panel	Listed for the panel
Feeder conductors	2 #3 Cu + #3 neutral + #8 EGC, 1" PVC	Listed, NEC 310.16

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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	[ ]
Feeder route and trench depth	Electrician	[ ]
Grounding electrode and disconnect at the building	Electrician	[ ]
Terminal ratings, 75°C	Electrician	[ ]
Equipment data attached	Electrician	[ ]
Code edition confirmed with the city	Electrician	[ ]

Approval

Reviewed by	
Signature	
Date	

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