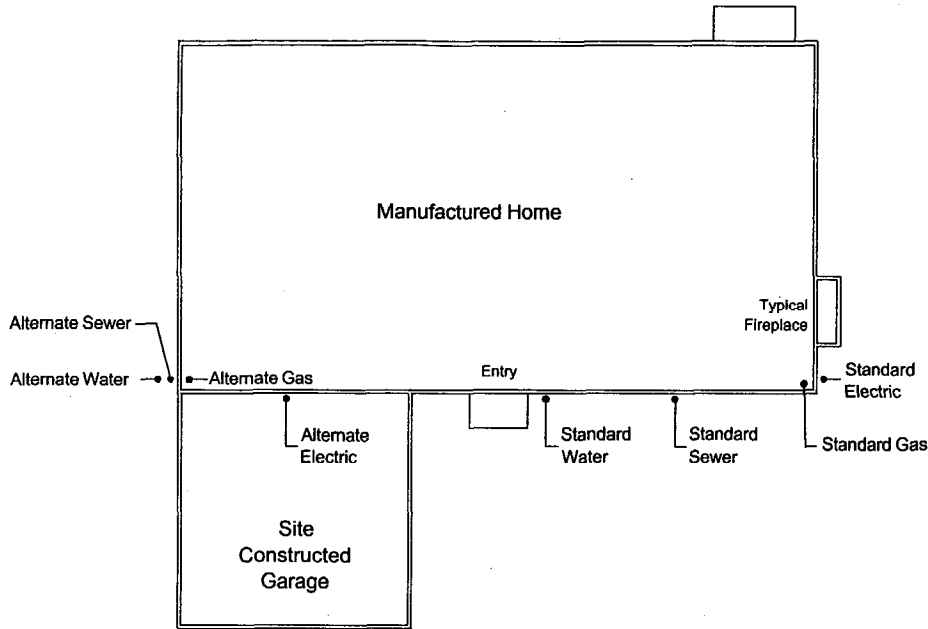


UTILITY PLANNING FOR RESIDENTIAL DEVELOPMENT PROJECTS

Manufactured homes set in subdivisions or on infill lots may require relocating the electric, water, sewer, and gas lines going into the home. Options for different configurations are discussed below.



These suggestions assume utilities are located in the street. If utilities are along the rear or side lot lines, adjustments would be made. Also, frost protection measures would modify some of these set-ups

Item	Standard	Alternate
Electric	Combination meter base, main and branch breaker panel, recessed in endwall, near corner. Choice of underground or overhead feed, with raceway through floor or through roof (with masthead).	Main and branch panel only, mounted in garage firewall, Raceway and sweep through top of firewall to accommodate routing to isolated meter base.
Water	Inlet located between 24" and 48" from front entry, away from garage. Allows incoming riser, shutoff valve and hose bibb for front yard.	Inlet at rear endwall, 12" to 18" from sidewall. To permit direct lateral to street, avoid trench under driveway. Used when lateral is at side property line.
Sewer	Termination approximately half-way between front entry and endwall of house. Capped about 12" to 18" from edge of floor.	Termination rear endwall, 12" to 18" from sidewall, capped about 12" to 18" in from edge of floor.
Gas	Termination approximately 24" in from edge of floor near corner of house. Permits routing through endwall or sidewall to meter.	Termination approximately 24" in from edge of floor near corner of house behind garage. Permits plumbing to gas meter location on garage wall.

APPENDICES

7





Exterior meter base installed after the home was installed, cluttering the side of the house.



Recessed combination meter base and panel box installed at the plant for a much cleaner look.

Electric

Standard - Factory should supply an installed combo meter base with main and branch breaker panel, recessed into endwall 12" to 18" from sidewall, set so that center of meter glass will be 45 7/8" above finished floor. Available for either underground or overhead feed. If underground, factory installs entry conduit down through floor. The site contractor is provided with the dimension of the distance from the sidewall where the conduit will penetrate the floor, so that a cavity for the conduit can be formed into the concrete foundation wall. If overhead, factory will run the conduit up through roof, terminated with a masthead. Terminals for telephone and cable television should be located in the vicinity of the electric meter.

Alternate - Factory installs the panel with the main and branch breakers on the garage firewall, adjacent to the fire door to the house, between the water heater and the fire door. The site contractor is provided the measurement of the distance from the endwall, so that an accommodation can be formed into the concrete foundation wall. The contractor then routes the main feeder conductors to the meter base, which will usually be located near the front end of the garage wall. The alternate method is applicable when there is no room at the standard location to mount the electric fixture (for example, when a bay window is located there), when the incoming terminus must be located on the opposite side of the house (to meet existing site situations), or when the meter must be located at the point nearest the street (to meet utility company requirements).

In either the standard or the alternate application, the factory provides no wiring beyond its installed main breakers.

Gas

The factory should terminate the gas line at a point approximately 24" inside either wall at the front corner opposite the garage. This will permit the site contractor to plumb and direct the line to the proper point at which the line exits the house. This point will vary, depending on the location of the electric meter, openable windows and crawl space vents.

Alternately, the factory would terminate the gas line at the same point on the other end of the sidewall. This permits the site contractor to plumb to the meter location on the garage wall.

The factory provides no additional materials beyond the end of its installed gas line.

Water

The factory should locate the water inlet at a point between 24" and 48" from the front entry, opposite the garage. This permits the site contractor to trench to this point, bring the riser out of the ground, install a gate valve (main shutoff) and a hose bibb, then enter the wall to tie in to the factory terminus.

Alternately, the factory will locate its inlet on the endwall 12" to 18" behind the garage to accommodate laterals located on that side of the lot. If so, the factory will provide a hose bibb between 24" and 48" from the front door.

In either case, the factory will provide one additional hose bibb in the back yard, between 24" and 48" from the rear yard door (typically a sliding glass door).

Drain Line

The factory should make every effort to keep the drain line as high as possible. The standard termination will be at a point 12" to 18" inside the edge of the floor, between 6' and 12' from the endwall opposite the garage.

Alternately, the termination point will be 12" to 18" behind the garage on the endwall.

Preparation for Washers, Dryers, and Water Heaters in the Garage.

In mild climates, much can be gained by setting up the house for this equipment to be located in the garage. This is acceptable in such climatic areas, and by doing so, a great deal of space can be made free for other uses in the house.

The manufacturer should provide a grade plan calling out the elevation of key items relative to the finished floor of the house. Especially critical is the location of the garage slab because the water heater, washer, and dryer will rest on the garage floor while being serviced by plumbing and electrical connections on the home sidewall.

Dryer electric outlet can be located within 6" of the finished floor of the house. The length and flexibility of the dryer cord allows vertical latitude.

Dryer vent is not a factory concern because the dryers will be vented through the garage wall. The manufacturer should plan for dryer locations to always be in the corner of the garage, next to the garage wall.

Washer water faucets need to be located so they are near the top of the washer, but not more than 6" above it.

Washer drain standpipe must also be located near the top of the washer. The standpipe must have at least 36" of vertical fall over the trap.

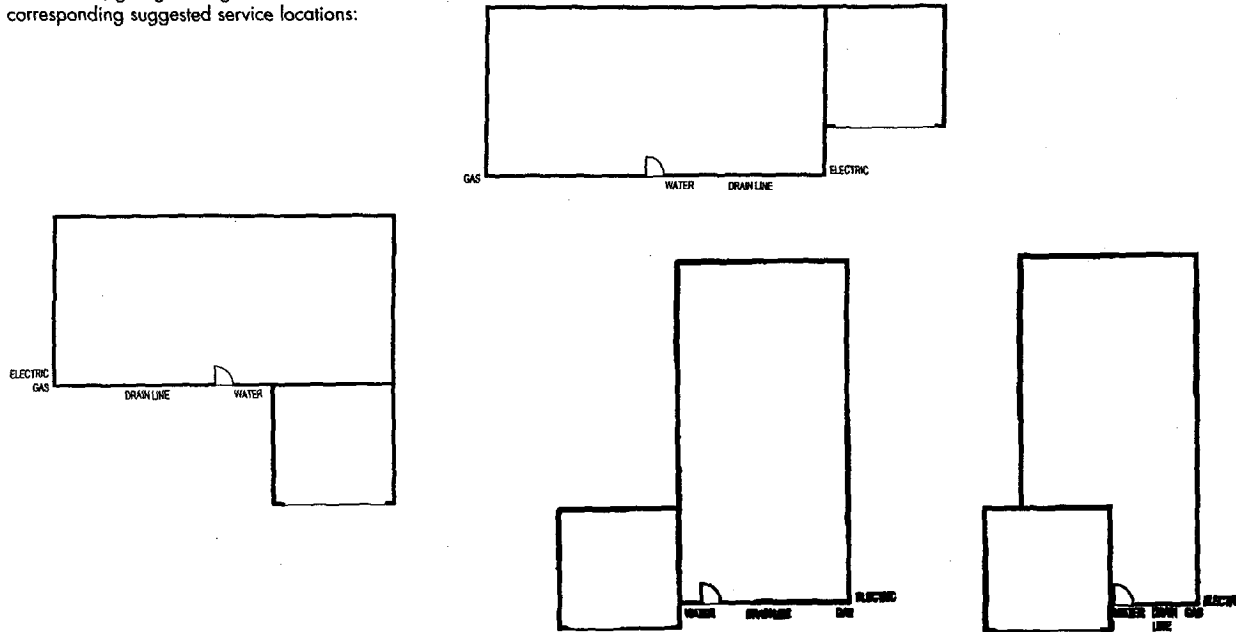
Water heaters must be installed on a pedestal at least 18" above the garage floor. Water and gas lines (or electric junction box in the case of an electric water heater) must be stubbed out in the appropriate locations, calculating the height of the heater plus the pedestal, and considering the relationship of the house to the garage slab. Some height variations can be absorbed by building a taller pedestal.

The factory would provide the water heater and the fittings. It should also provide instructions and drawings for the installation of the water heater.

Firewall penetrations and sealing must meet firewall requirements. Research into the best fittings, fixtures and sealants must be undertaken.

Other home/garage configurations and their corresponding suggested service locations:

Other home/garage configurations and their corresponding suggested service locations:



EXCERPTS FROM THE PINE RIDGE BUILDING SUMMIT CRITERIA

Oglala Sioux Tribe Partnership for Housing, Inc. HUD-Code Manufactured Home Criteria

I. GENERAL:

The Oglala Sioux Tribe Partnership for Housing, Inc. seeks the manufacture, delivery, and installation of approximately 15 HUD-Code *manufactured homes on individual sites on the Pine Ridge Indian Reservation in and around Pine Ridge, South Dakota. The sites are remote and/or subdivision lots over an approximate twenty five mile radius from Pine Ridge village. All homes must be delivered to individual sites no later than July 15, 1999 and be complete on foundations no later than July 30, 1999. The foundations will be by others. The set, close up and finish will be included work of the contract.*

II. PROCEDURES AND CONTACTS:

All persons and entities desiring to supply the work shall submit 5 copies of a written Proposal and Statement of Qualifications responding to all items in this Criteria (including an aggregate price that takes into account all applicable taxes and fees). All proposals must be received by the Partnership by no later than May 17, 1999.

Supplier selection is expected to be based on price and the other requirements in this Criteria, but Purchaser reserves the right to add, subtract or modify requirements at its sole discretion.

Following receipt of Proposals, the Purchaser anticipates negotiating with one or more proposed Suppliers to determine a final Supplier for the work. Purchaser specifically reserves the right, in its sole discretion, to reject any or all Proposals, to purchase more or fewer homes with similar or different specifications than set forth in this Criteria, to request further information from any proposed Supplier, to negotiate terms different than provided in this Criteria, to have the purchases made by individual tribal members or other persons or entities, to select one or more Suppliers for any reason it deems reasonable, and to waive any nonconformity.

III. STATEMENT OF QUALIFICATIONS

General Performance Criteria:

All Proposals must include the following information:

- General information regarding Supplier, including length in business, average unit sales (nationally and by geographic region), evidence of compliance with all applicable rules and regulations and licenses.
- Examples of similar prior jobs within the last 18 months involving delivery of between 5 and units.
- Names and contact information of 3-5 references, with detailed experience regarding compliance with specific delivery schedules and warranty performance

Specific Performance Criteria:

All Proposals must also provide evidence that Supplier does the following:

- Supply durable and energy efficient products
- Demonstrated commitment to customer service (including delivery, installation, set-up, and post-installation warranty and other work)
- Demonstrated ability to deliver large numbers of units to a remote location within required timetable

IV. PLANS:

Units shall have three and four bedroom, two bath plans on basement or crawlspace foundations - approximately 1,288 sf - 28'x46'. Approximately thirteen basement and two crawlspace units are anticipated. The exact quantity, floor plan and foundation type and buyer's selections are to be determined. Plan variations will be considered.

V. SPECIFICATIONS

All Proposals must be based on the following specifications:

A. Construction:

- Built to National Manufactured Housing Construction and Safety Standards
- HUD thermal zone III, wind zone I
- Cathedral ceilings throughout
- 4/12 roof pitch
- 2x6 exterior wall framing
- Class A 25 year warranty composition shingles
- 12" gable eaves
- Fixed or site installed sidewall overhangs - minimum 12" width

B. Foundation:

- Foundations (by others) for basement and crawlspaces will be 8" poured in place concrete or a precast concrete panel system (typically 10")
- Pressure treated sills and anchor bolts by others
- All components of standard chassis recessed 10" from floor edge with 8" foundation
- All exterior wall utility drops located minimum 10" from floor edge with 8" foundation
- Exterior siding or sheathing placed over raised galvanized z-bar at foundation closure
- All vertical trim boards cut 10' long and shipped loose
- Provide 4 sets of 18"x24" engineered foundations plans and span charts
- Manufacturer to provide details for supporting the marriage wall, including plans for location, sizing, and reinforcing of footers, beam requirement (if not part of the home section), and design of columns, in timely manner.

C. Chassis/Floor:

- Basement stair is desired to be per plan. Other configurations will be reviewed
- In basement sets, columns are allowed only at marriage line and around stair
- In crawlspace sets, any reasonable arrangement of supports will be considered
- In both basement and crawlspace sets, perimeter of home will be supported by and tied down to perimeter foundations and covered with inconspicuous trim
- Exterior decks are anticipated on the front and rear and provisions for their addition by others must be considered.

D. Energy Conservation:

- These units are required to be energy efficient and once installed field blower door tests are to be done by others
- Performance levels comparable to EnergyStar are desired.
- R-38 ceiling insulation
- R-19 wall insulation
- Basements and crawlspaces are insulated to R-8
- Attic vent system - note blowing snow is a venting concern

E. Exterior Walls:

- Construction by layer, from inside out
- Interior gypsum wallboard (GWB), taped, textured, and painted
- 6-mil poly vapor barrier
- 2x6 studs with R-19 unfaced fiberglass batt insulation
- 7/16 OSB sheathing
- Painted hardboard siding
- Exterior wall height 7'-6" above finish floor minimum
- Masonite or equal vertical and horizontal pattern siding

- Window, door, corner trim and eave and fascia trim to be determined
- Two coats of exterior paint over primed siding and trim

F. Exterior Doors:

- White steel raised panel insulated 36"x80" front door assembly
- Brass lockset and deadbolt, keyed alike
- White solid 32"x80", lockset and deadbolt keyed alike rear door assembly

G. Interior Doors:

- 6'8" height, oak finish slab doors
- Three mortise plate hinges per door
- Oak finish slab bypass wardrobe doors
- Brass knob privacy sets on bath and master bedroom doors
- Brass knob passage sets on other doors
- "Residential" grade door casings, jambs and stops

H. Windows:

- Dual pane, vinyl or vinyl clad wood, low-E glass windows - R-2.7 NFRC rated
- Pine stool & apron sills, to match trim

I. Electric:

- 200 amp service
- Factory installed recessed main/branch panel with meter base, underground feed
- Location of electric terminus per site plans
- Electric door chime - front and rear buttons
- Two phone jacks per plan, wired to bell box located per site plans
- Two TV/CATV jacks per plan, wired to junction box per site plans
- 20 amp waterproof receptacles on GFCI, located in front and rear

J. Lighting:

- Brass lantern or equal at front door; mason jar at rear door
- Dining room chandelier
- Two 2-tube 48" surface mounted fluorescent fixtures in kitchen ceiling
- One 2x60w spot, track or bullet fixture over kitchen sink
- All bedrooms: 2x60w pan ceiling fixtures
- Two 2x60w drum or globe fixtures in hall(s), on three way switches
- One fluorescent over each bath mirror to be selected
- One 1x60w drum or globe fixture in each bath ceiling
- One 2x60w drum or globe fixture in laundry area
- One ceiling fan with light kit in living room

K. Rough Plumbing:

- CPVC or PEX potable water system
- Shut offs at each fixture
- ABS DWV system, all plastic autovents okay
- Propane gas plumbing
- Terminus locations for water, drain, gas per site plan
- 40 gallon propane water heater - .56 energy factor
- Two frost proof hose bibbs - front and rear

L. HVAC:

- Propane downflow 60,000 btuh furnace (approximate size) - .88 efficiency AFUE
- Fresh air system integrated with furnace
- Provide supply and return at basement and unvented, insulated crawlspace
- Floor vents located in non-traffic areas
- Return air transfer grille over interior doors at bedrooms

M. Kitchen:

- EnergyStar rated 18 cf refrigerator
- Deluxe propane free standing range with window, clock, oven timer
- Upgrade hardwood cabinet stiles and door/drawer fronts - submit sample
- Visible hinges acceptable
- Interior cabinet pre-finished - no exposed cleats or fasteners
- High pressure laminate counter top, self edge; block backsplash
- 29" base cabinet doors, one drawer bank - or per drawings
- Stainless steel ledge double sink - residential quality
- Single lever faucet with spray

N. Baths:

- One-piece fiberglass tub and/or shower in each bath
- Upgraded shower enclosure
- Recessed medicine cabinet with mirror door
- High pressure laminate lav top, self edge; block backsplash
- Porcelain sink, dual control faucet, pop-up and overflow
- Power vent fans
- 1.6 gallon ultra low flush toilets

O. Utility:

- Plumb and wire for washer (crawl space model)
- Prepare for basement located washer and dryer per plan
- Wire for electric dryer
- Base and overhead cabinets or linen closets per plan

P. Interior Finish:

- All interior walls are GWB, taped, textured with soft spray knock-down and painted
- Kitchen, bath and laundry semi-gloss off white paint
- Balance of home walls flat off white paint
- All ceilings textured with soft spray knock-down
- Kitchen, bath and laundry ceilings painted semi-gloss off white
- Balance of home ceilings painted flat off white
- 2 1/2" reversible baseboard - installed at factory 1/2" above floor
- No moldings at ceiling / wall joint

Q. Floor Coverings:

- Vinyl in kitchen, dining, baths, laundry area, or stair area and entry
- Minimum FHA grade level cut pile carpeting in balance of home
- Minimum 1/2" rebound carpet pad
- Carpet and pad shipped loose with adequate tack strip, seaming tape and carpet bar

R. Window Coverings:

- Metal mini blinds at each window
- Vertical blind at picture window

S. Transport:

- All sites are next to or near public roads. A graded route from the roadway to the home site is expected to be built by others
- Do not subject the home section to stresses greater than those for which the home section was road-tested
- Where necessary to bridge dips or short sections of uncompacted soil, provide portable ground mats or short bridges of metal mesh, fiberglass, or multiple layers of OSB or plywood.
- Provide level ground with adequate headroom near the home to park the home sections during erection by crane or rollers
- Do not drive over underground utilities that can be damaged by wheel loads
- Remove and return to dealer hitch and running gear from shackles down, with proper notice to buyer

T. Warranty

- Warranties for all items not specified above shall be at least as good as Supplier

SELECTED LIST OF INTERVIEW PARTICIPANTS

George Allen, GFA Management
Eric Alexander, MHI
David Alley, P.E. Alley & Associates, Inc.
Gerry Brown, Cavco
Guss Davis, Smithfield Neighborhood, Inc.
Elliot Fabri, New Era Building Systems
Bill Farish, Fleetwood Enterprises, Inc.
Ros Farland, Fleetwood Homes
Noel Fernandez, Jensen Residential Communities
Craig Fleming, Silvercrest Homes
William Freeland, Neighborhood Development Corporation
Kent Hogan, McStain Enterprises, Inc.
Steve Hullibarger, The Home Team
Kris Jensen, Jensen Residential Communities
Dennis Jones, R-Anell Custom Homes, Inc.
Warren Keyes, Liberty Homes
Randy Luther, Centex
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Frank Walter, MHI
Donald Westphal, ASLA
David Whitson, American Homestar
Jeff Wick, Wick Building Systems, Inc.
Walt Young, Champion Enterprises, Inc.

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