Farmstead Planning

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Why spend time planning for your farmstead?

- To have more time off
- To reduce labor requirements
- To get more product to market
- To reduce risk when investing in growing and provide multiple stage approach for expansion
- To provide separation between farm & family areas

What do I need to do?

- Know what you have:
  - A map or drawing of the farmstead's layout
  - Inventory of resources (land, water, power, buildings, permanent equipment, feed/grain storage)
  - Useful life remaining on structures & equipment
  - Anticipated annual crop and livestock production numbers
- Know what you need:
  - Write down short and long term needs
  - Provide a list of anticipated new buildings & equipment

How do I create a layout of my farmstead?

- Creating the as-is drawing:
  - Drawing on graph paper
  - Aerial Photo: ask FSA or NRCS to print one
  - Aerial Photo: print one yourself with Google maps, ect…
  - Computer Drawing or GIS
- Adding options for future structures:
  - Create lots of copies
  - Trace paper
  - Cut-outs to represent expansion that can move around
  - Computer to move/modify a new structure

What if I am creating a new farmstead?

Six Critical Factors

Zoning

Local Terrain

Roads and Farm Drives

Water Supply

Electricity

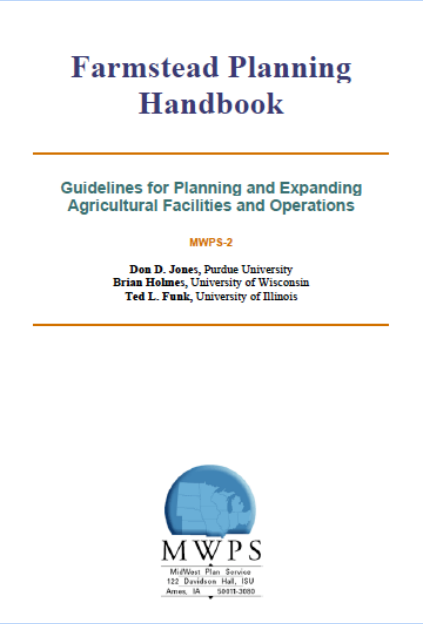
Manure Utilization Suitability (for farms with livestock)

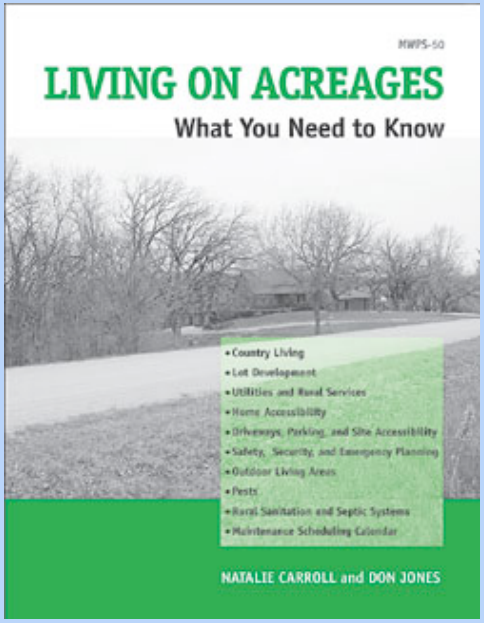
How do I know what works and what does not work when developing on my farmstead plan?

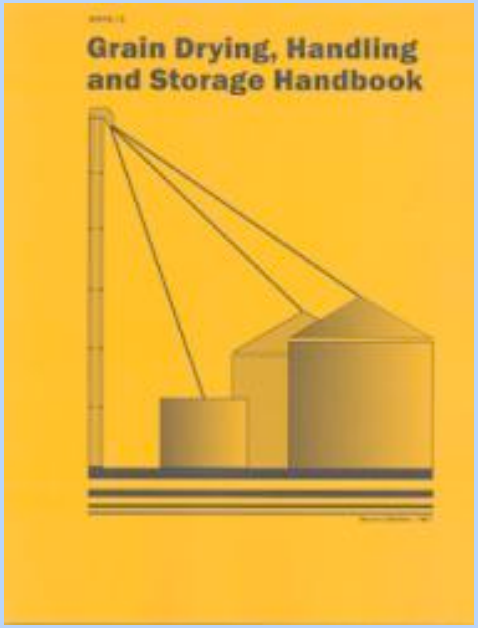
Midwest Plan Service:

MWPS-2 Farmstead Planning Handbook

https://www-mwps.sws.iastate.edu/







How large should my farmstead be?

Table 1-2. Approximate space needs for farm buildings & adjoining areas.*

FARMSTEAD COMPONENT	Sq. Ft.	Acres
House/attached garage & adjacent yard	20,000--40,000	0.5-1.0
Well (100 ft. radius)	37,000	0.72
Household wastewater system and replacement area	5,000--20,000**	0.11-0.46
Windbreak, shade trees	0--20,000	0-0.5
Driveway & service yard	0--20,000	0-0.5
Shop & adjoining parking space	1,000---5,000	0.02-0.1
Machinery storage, parking	1,000--50,000	0.02-1.2
Chemical storage/handling area	1,000--2,500	0.02-0.6
Crop storage	1,000--30,000	0.02-0.7
500 head cattle feedyard	10,000--150,000	0.3-3.4
1000 head cattle feedyard	25,000--350,00	0.6-7.9
100-sow farrow/finish system	5,000--10,000	0.1-0.2
200-sow farrow/finish system	200,000	5
600-sow farrow/finish system	350,000	8
50-cow dairy stallbarn, w/heifers, no manure storage	20,000--40,000	0.50 - 1.0
100-cow dairy freestall w/heifers, parlor, (a)	70,000--100,000	1.5-2.5
500-cow dairy freestall w/heifers, parlor, (a)	250,000-300,000	6-7
1000-cow dairy Freestall w/heifers, parlor, (a)	490,000-615,000	11-14

*use only for approximate building space; see other MWPS Handbooks for specific information on enterprise arrangement. Example: estimate the space needed for a basic farmstead with only a house and shop: (house) 40,000 + (windbreak) 20,000 + (driveway) 20,000 + (shop) 5,000 = 85,000 sq. ft. @ 43,560 sq.ft/ac approximately 2 ac.
**house size and soil type dependent.

Water

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- Source and Quality
- Does it need to be developed
- Account for present and future needs

Proposed Rates

1st 1,000 gallons	29.75 (minimum bill)
Next 4,000 gallons	6.30 per 1,000 gallons
Next 5,000 gallons	6.58 per 1,000 gallons
All over 10,000 gallons	7.84 per 1,000 gallons

Water Billing/Rates

How to Calculate Your Residential Water Bill

Effective for all bills rendered based on meter readings made on and after December 1, 2009.

Monthly Minimum Charges

		CF Allowed
5/8" Meter	$18.00	300
3/4" Meter	$18.00	300
1" Meter	$28.95	600
1-1/2" Meter	$43.55	1,000
2" Meter	$69.10	1,700
3" Meter	$89.05	2,500
4" Meter	$170.05	7,000
6" Meter	$350.05	17,000

All minimum charges are applicable to a single dwelling unit or a single place of business only. If one meter is used to supply more than one dwelling unit or business unit, minimum charge will be applied to each unit just as if all units were separately metered.

Commodity Charges

First 300 Cubic Feet	Per 100 Cubic Feet Per Month	$6.00
Next 1,700 Cubic Feet	Per 100 Cubic Feet Per Month	$3.65
Over 2,000 Cubic Feet	Per 100 Cubic Feet Per Month	$1.80

Water

Table 10-3. Average daily water needs for a typical farmstead.

Water use per	Gal/	Washing operation	Water	Use	Total	Flow
Milking cow	35-	Bulk tank[e]		Adult or child	50-	
Dry cow	20-	Automatic	50-60	Baby	100/day	
Calves (1-1½)	5-10	Manual	30-40	Automatic washer	30-	5
Swine, finishing	4	Pipeline		Non-automatic washer,	15-	5
Nursery	1	In parlor (volume	75-125	Dishwasher	7-15/load	2
Sow & litter	8	Pail milkers	30-40	Garbage disposer	4-6/day	3
Gestating sow	6	Miscellaneous	30 gal/day	Kitchen sink[a]	2-4/use	3
Beef animal	15-	Cow preparation	Gal/wash/co	Shower or tub[a]	25-	5
Beef animal (cow)	25	Automatic	1-4½	Toilet flush[b]	4-7/use	3
Sheep	2-4	Estimated	2	Bathroom lavatory	1-2/use	2
Horse	12	Manual	¼-½	Water softener	50-	5
100 chicken	9	Parlor floor	40-75	Backwash filters[c]	100-	10
100 turkeys	15	Milkhouse floor	10-20	Outside hose faucet	---	5
				Fire protection[d]	1200/2-hr	10

[a] Water flow restricting valves and shower heads can reduce flow and water use by up to 50%
[b] Ordinary toilet; low-flow toilets will reduce water usage by 40%-90%
[c] Water hardness, softener size, etc. affect water use
[d] For limited fire fighting; at least 10 gpm with a ¼" nozzle at 30 psi for 2 hr/day. Preferred: 20 gpm at 60 psi - 2400 gal.
[e] Milkhouse and parlor water use varies greatly because of varying system design and management. Use these values as an estimate only.

Electricity

- Central installation location
- Size for future growth
- Consider underground placement for lines

  (keep detailed notes on placement of lines)

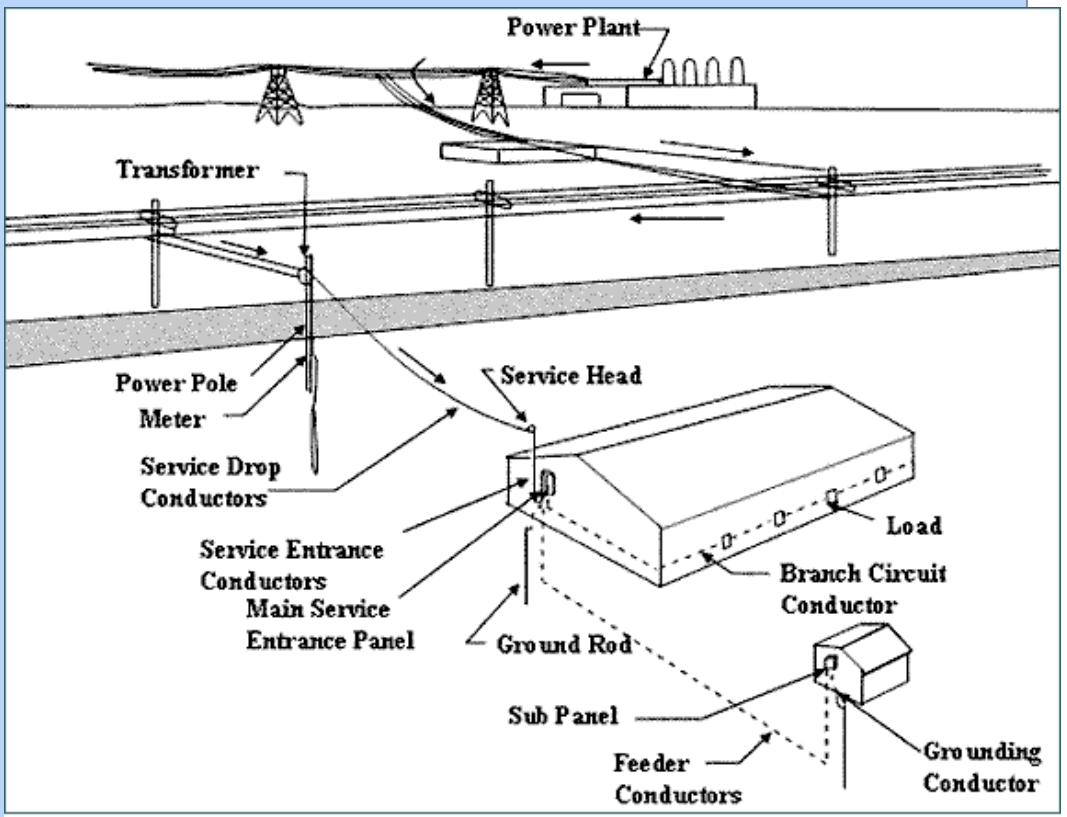


Figure 10-1. Electric power from generation to farmstead.

Farm Drives - Entry

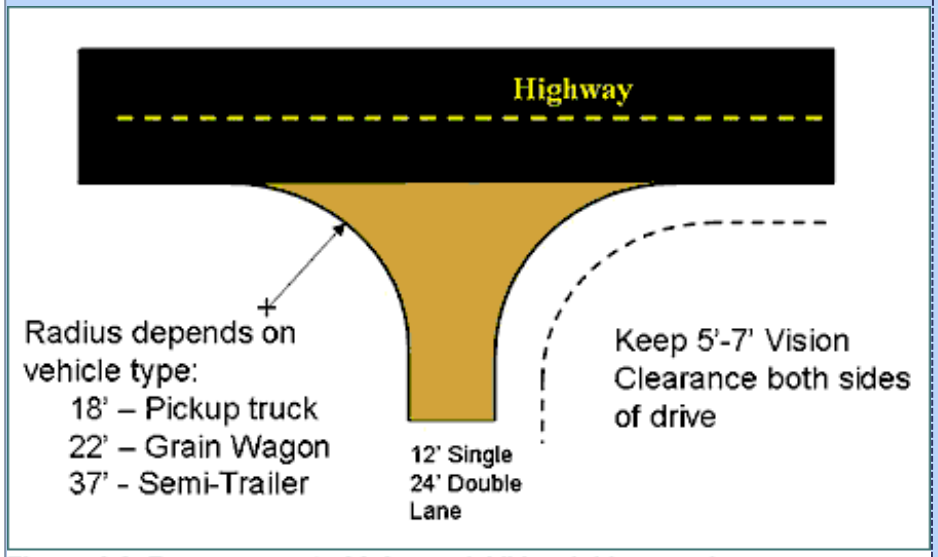


Figure 4-3. Farm access to highway. Additional driveway clearance accommodates overhanging equipment and provides a place to stack cleared snow in winter.

- Visibility
- Turning Radius
- Fairly Level Ground
- Include Sign By Road
- Set Gates Back From Road

Farm Drive - Spacing

Drives: 8-12 feet wide

*16 feet for farm equipment

1 drive for small-medium farms:

convenient & easier maintenance

2 drives for large farms:

lower traffic near the home or separate traffic for two parts of the farming operation

Branch drives can also reduce some traffic near the farmstead

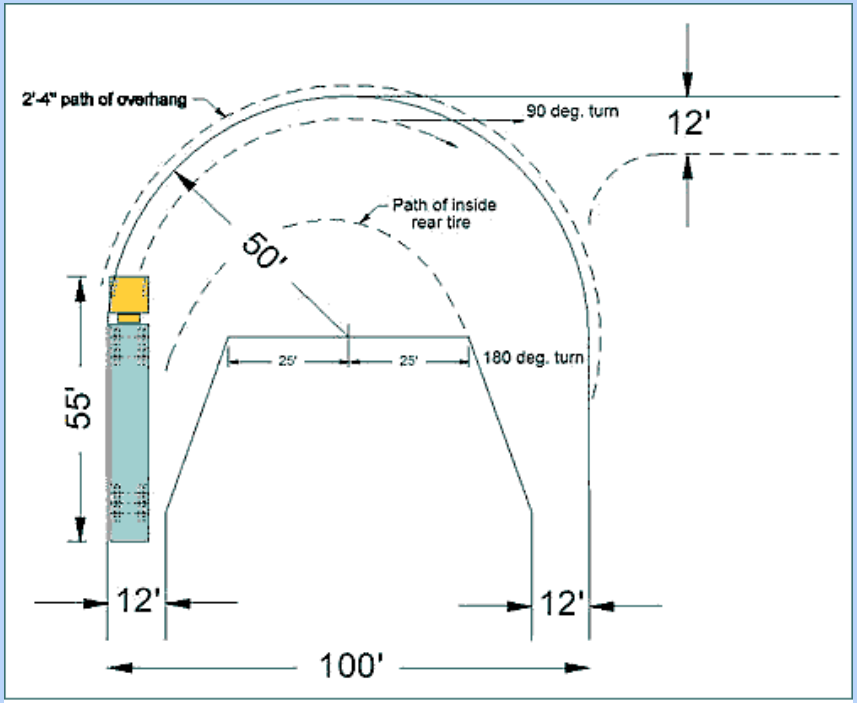


Figure 4-8. Space for turning wagons and smaller farm trucks in a service yard.

Farm Drive - Good Foundation

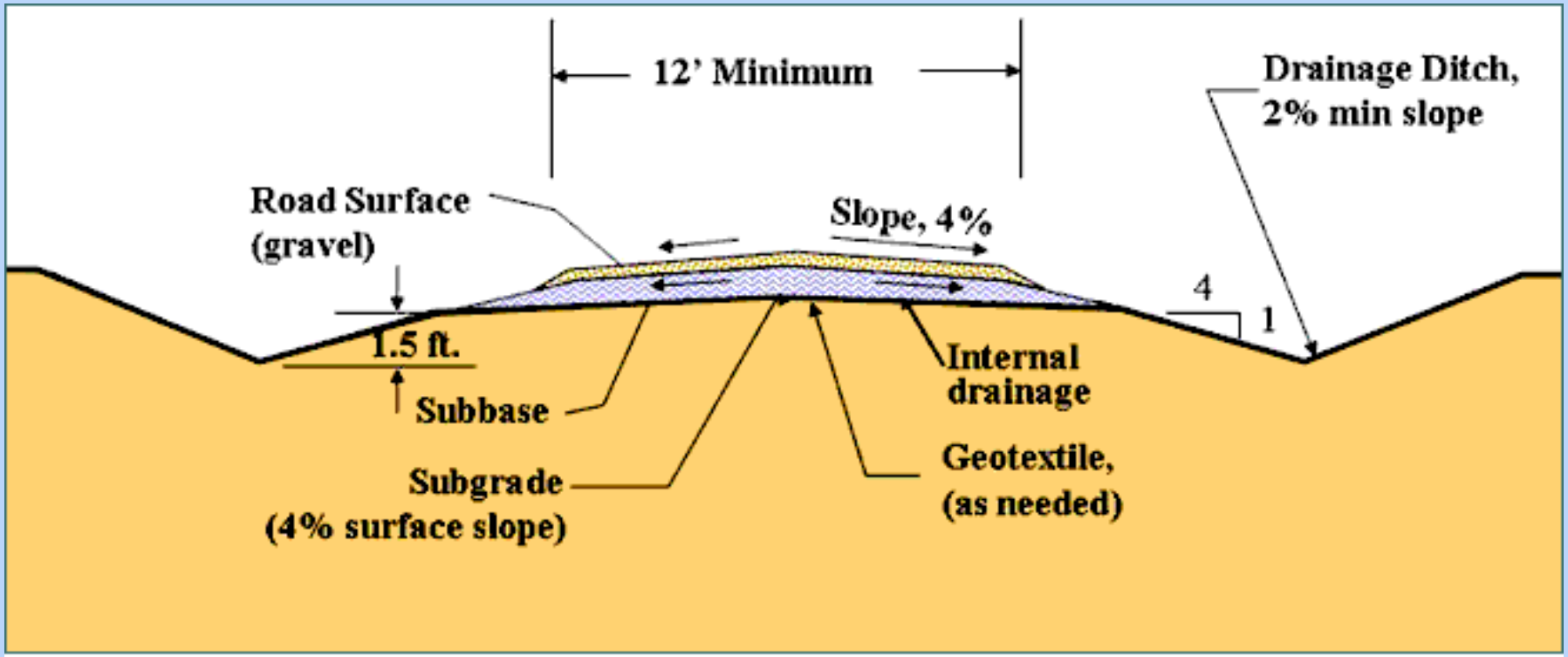
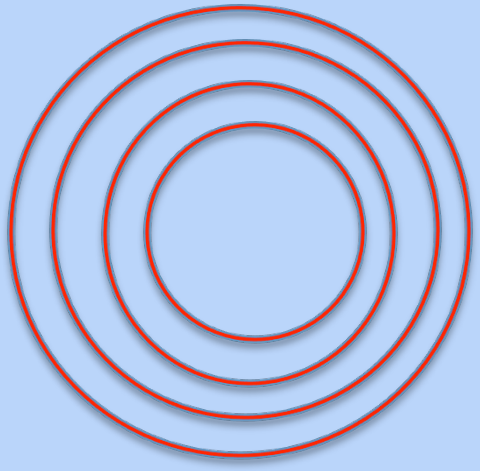


Figure 4-10. Cross section - gravel road drainage system.

Farmstead Layout: Zone Planning

All Zones are 100-200 foot concentric circles

- Zone 1: Home/Farm Center
- Zone 2: Machine Shop
- Zone 3: Grain/Feed Storage & Small Livestock Area
- Zone 4: Major Livestock Area



Zone 1: Home/Farm Center

Considerations

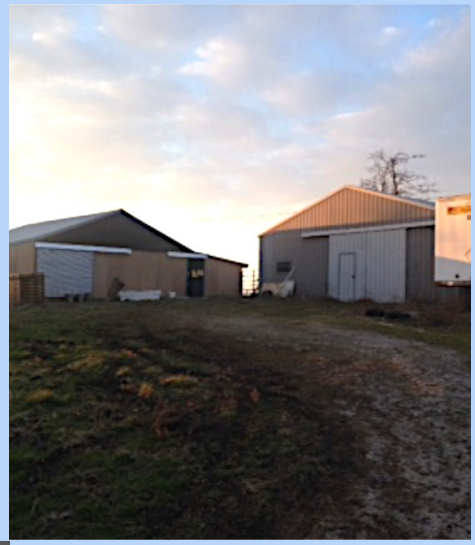
- Aesthetics
- Good Visibility
- Close to Road
- High Ground
- Water Source
- Septic Setback
- Low Impact of Dust, Odor, Insects & Farm Machinery

Zone 1: Home/Farm Center

Zone 2: Machine Shop

Considerations

- Good Drives
- Parking Area
- Utilities
- Fuel & Chemical Storage to the Outside of the Zone

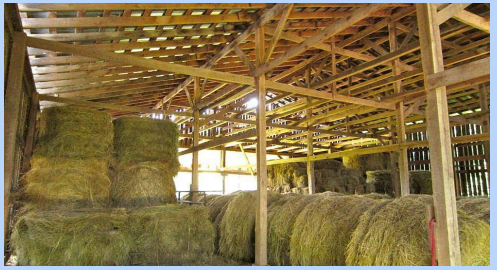


Zone 2: Machine Shop

Zone 3: Grain/Feed Storage
Small Livestock Areas

Considerations

- Access
- Electricity
- Wind Speed & Direction



Zone 3: Grain/Feed Storage
Small Livestock Areas

Zone 4: Major Livestock Areas

Considerations

- Access
- Low Visibility
- Wind Speed & Direction
- Manure Storage Location
- Mortalities

Zone 4: Major Livestock Areas

Central vs Satellite Sites: Grain & Livestock

Centralized Site

+ Efficient year-round management of product
+ Simpler delivery of inputs
+ Better security
+ Newer technology-more expensive components
+ One electricity/fuel service
+ Less equipment required
+ Less drive maintenance

Satellite Sites

+ Shorter transportation distances seasonally
+ Biosecurity
+ Product segregation
+ Crop loss prevention
+ Lower animal numbers reduces regulations
+ Existing structure available with land lease/ purchases

Final Thoughts

- Don’t expect farmsteads to be perfect:

planning decisions are always a balancing act

- There are always multiple good options for a farmstead layout
- Prioritize concerns on your farm and have a plan for when to address them
- Do not spend money placing an expansion or new structure in location in order to utilize a structure you don’t wish to keep

Questions?

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