

LAND DEVELOPMENT CONSIDERATIONS

3327

(Sept 1999)

These are factors related to the anticipated future land modifications, addition of buildings and other structures, utilities and services. See Exhibit 3324-3329 for checklist.

DRAINAGE AND GRADING

3327.1

(Sept. 1999)

An analysis of topography, local soils, and future development is important from the storm drainage standpoint in order to provide against site wash-out, saturated foundation conditions, and undesirable site ponding.

The extent of grading is necessary to determine the amount of manpower and equipment required and the probable time needed for accomplishment. For this report:

Determine patterns of existing land drainage and possible effects of rechannelization both within and outside of the site boundaries. The effects of concentrated water runoff due to site improvement must be considered. If there is a stream or channel nearby, a flood routing study should be made to determine effect on proposed improvements. The legal ramifications at the concentrating water flow should be considered.

Determine probable extent of earthwork required to develop an access road and to prepare the site for its intended purpose.

For each alternative access provide:

An excavation quantity estimate.

The estimated quantities of imported fill material.

If there will be excess excavated materials, state the possible area of disposal within the site and off-site.

If fill materials are required, determine and indicate the locations of a supply in the vicinity and approximate unit cost.

ELECTRICAL

3327.2

(Sept. 1999)

Electrical power requirements for the smaller CDF installations, including most Forest Fire Stations, are generally limited to 120/240 volt single-phase service; however, the larger installations and locations requiring service to motors 7-1/2 horsepower and larger will normally require three-phase power served at 120/208 volts.

If distribution lines within a facility are extensive, service should be at 480 volts to lessen distribution line power loss. Small installations may have power requirements as low as 3-1/2 to 5 kilowatts whereas connected loads at 80-man conservation camps are approximately 200 kilowatts. For this report:

State the name and address of the nearest branch office of the local electric utility company.

Determine the nearest points from which power is available to serve the site. If three-phase power is needed, determine the additional lengths required to extend such service to the site.

Check with the power company and local citizenry to appraise the reliability of power service relative to the following:

Voltage regulation.

Power outages: their frequency, and duration.

Determine approximate cost of power line extension and approximate amount of free footage allowed by the power company.

WATER SUPPLY

3327.3

(Sept. 1999)

Water requirements will normally be met by obtaining supplies from the following sources (in order of descending desirability):

Municipal water districts serving treated water.

Wells of good quality.

Springs or artians, not needing water treatment.

Surface supplies and ditches.

Any combination of the above, but requiring water treatment.

Truck hauling (lookout and temporary sites only).

Water quantities required for permanent sites with personnel assigned for day-to-day operation can be determined on the basis of 200 gallons per person per day. This will also service the normal landscaping irrigation needs, but if extensive planting areas or orchards are to be irrigated, additional water quantity must be calculated and provided.

Instantaneous domestic water demands will vary from about 10 gallons per minute (gpm) at smaller stations to over 50 gpm at conservation camps. Normal station fire protection requires a minimum of 40 gpm at 40 psi pressure at the hydrant, but more volume and pressure are desirable if easily obtainable. The special needs of nurseries and other high-volume installations must be considered on a calculated basis prior to site investigation.

Where water is obtained from springs, surface supplies, or wells, final storage should be provided in 10,000 gallon CDF concrete tanks, situated high enough to provide a gravity water pressure system wherever possible.

For this report show all possible sources of water available to the site.

If service is available from a municipality or water district, provide the following:

- Name and address of serving utility.
- Locations of existing water mains.
- The size of the water main.
- Maximum static pressure
- Minimum operating pressure during peak flow periods.
- Firmness of the supply. Is it intermittent? Seasonal?
- Approximate cost of extending the main to the site.
- Schedule of monthly water rates.
- Any special terms and conditions required of service contracts.

When the best source appears to be from wells, check with local well drillers, well owners, and Department of Water Resources to determine:

- Locations of existing wells.
- Drilling conditions encountered and drilling methods employed.
- Depth, diameter, and water yield of each well.
- Planned system development features.

If water is to be supplied from a spring, surface impoundment, or ditch indicate:

- Elevation of water surface.
- Best location for water take-out.
- Water right status.
- Planned system development features.

For all sources determine if water treatment is required to afford potability. Provide reports of recent bacteriological, mineralogical, and radiological analyses on sources under consideration.

SEWAGE TREATMENT AND DISPOSAL

3327.4

(Sept. 1999)

Where a municipal, community, or sanitary district sewage disposal system is available within a reasonable distance, this means of disposal should be utilized. Otherwise, treatment and disposal by one or a combination of the following methods should be considered.

Septic tank treatment followed by:

- Leaching field
- Seepage pits
- Evaporation and filtration bed
- Stabilization ponds
- Sprinkler spray field or green belt
- Chlorination
- Mechanical extended aeration plant treatment followed by:
- Stabilization ponds
- Sprinkler spray field or green belt

Conventional sewage treatment plants are not normally considered because of greater initial cost and the specialized training and attention needed for satisfactory operation. Raw sewage lagoons may have possible application, but special environmental studies should be made prior to consideration. The particular method chosen will depend upon soil and climate characteristics of the site, potential land acreage available, and proximity of off-site developments. Consultation with Regional Water Quality Control Board engineers and local health officials is desirable.

Although sewage and waste quantities generally average 60 to 85 gallons per person per day, installations should be based upon 100 gallons per person per day if a large visitor or manpower expansion load is probable.

For this report state method of sewage treatment and disposal.

If discharge will be to a municipal or sanitary district indicate:

Name and address of the serving utility.

Location of existing manholes and probable point of connection to the existing utility system.

Invert elevation and existing sewer size at manholes or other points of connection.

- Cost of extending the existing branch sewer to the proposed CDF property line.
- Schedule of charges for participation in system, connection to system, and monthly service.
- Any special terms and conditions required of service contracts.

Where sewage service is not available from others, provide percolation test data for a number of test holes made at the site of possible leaching fields (if the owner's permission can be obtained for this purpose). Provide test data even if the results indicate unfavorable leaching conditions.

GAS
(Sept. 1999)

3327.5

Natural gas is preferred, rather than liquefied petroleum gas (LPG), as a heating fuel and as the primary fuel for operation of standby electric generators.

For this report determine availability of natural gas near the site.

- If gas is available nearby, indicate the following:
Name and address of utility company.
Location of nearest gas main.
Cost to extend service to the site.
- If gas is not available, determine whether the site is within an operating area of a gas utility company.

COMMUNICATIONS
(Sept. 1999)

3327.6

It is the policy that at least two modes of communication be made available to every fire control active operation site. Generally this requires land lines for telephone and related services, plus a radio system.

For this report include the following:

- Name and address of telephone company.
- Location of the nearest telephone terminal point.
- Whether or not a single party service be obtained.
- The approximate cost of extending the phone truck lines.
- The best locations for placement of radio antennae by checking transmission and receiving adequacy under all currently used radio frequencies.

NOTE: The services of a Communications Division engineer should be requested to conduct the antenna site adequacy survey

IMPROVEMENTS
(Sept. 1999)

3327.7

The proposed site and all immediately adjacent properties should be investigated for improvements existing above and below the ground. In addition, sources of natural construction materials should be identified. For this report:

Identify location of existing improvements and indicate the following:

Materials of construction.

Physical condition.

Photographs, as appropriate.

In areas proposed for new construction, investigate foundation soils and report any unusual conditions, which may require special design consideration. Section 3326.2, relating to geologic conditions, should provide relative information concerning any further investigation required here.

Determine locations of suitable sources of the following:

Base materials for building pads, parking areas, and roads.

Aggregates for concrete.

Transit mixed concrete.

Asphalt concrete.

Select import materials (clean fill, and so on.)

**FORMS AND/OR FORMS SAMPLES: RETURN TO ISSUANCE HOME PAGE
FOR FORMS/FORMS SAMPLES SITE LINK.**

[\(see next section\)](#)

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