

2.0 SITEWORK
ARTICLES

NOTES

2.1.0 INTRODUCTION

Landscaping played an important role in the final design of military bases established before World War II. The historic landscape and planting scheme at Fort Lewis is an integral part of a preservation program. Due to the overgrown nature of most plantings at the post, an historic landscape plan is needed to guide rehabilitation and replacement of landscape elements within the historic district. An historic landscape plan is beyond the scope of this study. Some general guidelines can be indicated, however, based on general landscaping at installations of similar age.

Unlike turn-of-the-century landscaping where planting materials were maintained with a "natural" look, installations built in the 1920s and 1930s had a more formal planting scheme and plantings tended to be more formally clipped or pruned.

Landscaping included circulation paths and formal planting beds in an integrated scheme following more classical planning practices.

Vertical plantings such as yew, cedar, juniper, or arborvitae were used to highlight entryways and corners of buildings; bedding areas adjacent to foundations had similar but lower shrub variants. The lower shrubs were not tightly clipped into formal shapes.

Some lower clipped formal plantings such as laurel flanked walkways leading to major entryways. Although flowerbeds and groundcover did occur more frequently than in earlier periods, their use was limited. Flower planting beds are more prevalent near officer and NCO residences.

Larger trees (either coniferous or deciduous) were planted in rows to delineate the difference between functional areas such as parade grounds and barracks. These generally line both sides of streets near the curb.

Additional large scale ornamental trees were planted as part of the overall landscaping scheme in open areas between buildings.

Landscaping elements at Fort Lewis have become overgrown and obscure the historical character of the district.

Lack of periodic maintenance can cause serious damage to buildings including deterioration of foundations from extensive root systems, physical damage from beating against building elements, and moisture problems to building fabric.

Historic landscapes present a difficult planning problem in a district. Unlike buildings, which may be repaired, plants mature and die, or, in cases of neglect, become too overgrown for pruning. Proper maintenance includes replacement of plant materials and trees with similar varieties that are in keeping with the character of the original planting scheme.

2.1.1 TYPICAL REPAIRS

2.1.1.1 GENERAL

An overall landscape plan for the historic district should be developed including a specified maintenance schedule for new plantings. The program should be

developed by a landscape architect familiar with the characteristics of an historic military post. Consideration should be given to providing parking areas adjacent to but separated from the buildings. For example, the use of the rear courtyard spaces behind the barracks buildings for parking should be modified and developed with landscaping. Off-street parking should not occur in front of buildings (with the exception of utilitarian structures) and where parking occurs immediately adjacent to the rear, a separation of grass and curb blocks should be provided.

2.1.1.2 Dead or dying plantings.

CAUSE

Mature growth, lack of maintenance (water, fertilizer, etc.), physical damage, or disease.

REPAIR

Replace in-kind or in accordance with a developed comprehensive landscape plan.

If diseased, evaluate the nature and if it is a pervasive disease (such as dutch elm disease) substitute a non-susceptible variant that has a similar appearance to the original.

2.1.1.3 Overgrown plantings affecting building fabric.

CAUSE

Lack of routine pruning or poor original landscape planning.

REPAIR

Evaluate planting in relation to historic planting schemes.

If planting is incidental, remove it.

If it adheres to historic planting arrangement, replace in kind or in accordance with a comprehensive landscape plan.

If the planting is a tree that is too close to a building, replace in kind but relocate position to allow adequate clearance of structure.

2.1.2 MAINTENANCE RECOMMENDATIONS

- A. Planting materials at Fort Lewis should be inventoried to identify the range of plant types and their condition.
- B. Different trees and shrubs require pruning during different seasons and require different techniques. A seasonal maintenance schedule should be developed based on the plant inventory.
- C. Plantings should be pruned in a formal or natural pattern depending on the results of a comprehensive historic landscape plan.
- D. Plants and lawns should be fertilized on at least an annual basis.
- E. In many cases, trees and shrubs adjacent to buildings have become too overgrown for effective pruning. Replacement in-kind is probably necessary, followed by an annual pinching-back and light pruning.

2.2.0 INTRODUCTION

Ground surfaces ideally should grade away from building foundations to reduce the amount of groundwater immediately next to foundations. Constant moisture against foundations will cause deterioration and moisture leaks to interior basement spaces.

Some ground levels at Fort Lewis have risen due to natural thatch buildup and maintenance practices. This has modified the original drainage pattern, in some cases, so that water ponds towards the building foundations. In some cases, the grade is above basement window sills, which causes sash deterioration.

Gutter downspouts should be sewered or channeled to a drainfield away from the building. Some buildings have decorative cast iron downspout boots that discharge directly to the ground. Concrete splash blocks should be used to channel water to the far edge of planting beds and away from the foundation. These specific historic items are important building elements and should not be converted to a closed sewer system.

2.2.1 TYPICAL REPAIRS

2.2.1.1 Site drainage towards building.

CAUSE

Buildup of ground surface or poor original site preparation.

REPAIR

If feasible and as part of an overall landscape plan, recontour surrounding landscapes that drain towards building foundations so that drainage patterns are away from building.

If this is not possible, install a french drain to intercept groundwater.

Asphalted channelizing ditches are not desirable because of their appearance although they may be acceptable around some of the utilitarian storage or shop buildings.

2.2.1.2 Plugged gutter downspout drains.

CAUSE

Organic matter from gutters or root damage to sewer pipes.

REPAIR

Some sewers appear to be severely clogged from lack of routine maintenance and there appears to be no documentation of the original sewer design.

A number of systems may require complete rebuilding.

New systems could include replacement of sewer lines with new hookup to main stormsewer or development of a drywell system.

Subsurface lines may be tile or PVC, but only tile or cast iron caps should show above ground surface at connection with downspouts.

If drywells are used, each major downspout should drain into one drywell.

PVC should not be used as a replacement for downspout boots.

2.2.2 MAINTENANCE RECOMMENDATIONS

- A. Keep groundsurfaces below basement window openings. In adjoining planting beds that receive annual treatment with bark or other mulches, this may require periodic removal of soil to maintain a constant level. Slope beds away from building.
- B. Inspect storm sewer lines or drainfields annually and clean any clogged lines. Sewers should have a cleanout tap at ground connection. Flush sewers with pressure wash annually to maintain operability. Test drywells annually with running water from a garden hose to confirm effectiveness; rebuild clogged drywells.

2.3.0 INTRODUCTION

Concrete is composed of cement, water and aggregate. The aggregate may be sand, gravel or crushed stone. The most common cement is gray Portland cement.

Concrete can be mixed using a variety of proportions depending on the strength or durability required. See Article on "Small Job Concrete".

Concrete strength is increased with more cement and less water.

Concrete is usually reinforced with steel reinforcing rods or wire mesh.

Concrete is not inherently waterproof.

2.3.1 TYPICAL REPAIRS

2.3.1.1 Concrete is generally soiled.

REPAIR

Scrub with bristle brush and spray with garden hose.

2.3.1.2 Concrete is stained.

REPAIR

Scrub with trisodium phosphate solution and rinse.

REPAIR

Sprinkle dishwasher detergent on stain, rinse after 5 minutes with boiling water.

2.3.1.3 Concrete is clad with moss.

REPAIR

Scrub with bleach solution and rinse or with zinc diluted with 40 parts water or with magnesium silica fluoride diluted with 40 parts water.

2.3.1.4 Concrete is soiled by bird droppings.

REPAIR

Scrub with water and mild detergent. Do not use bleach due to toxic gas formation.

2.3.1.5 Concrete is retaining water.

REPAIR

Clean concrete.
Apply siloxane water repellent in late summer when dry.
Comply with manufacturer's recommendations.
Divert source of water if possible.

2.3.1.6 Loss of Concrete (spalling). Cracks or impact damage are evident.

CAUSE

Entry of moisture into concrete at face.
Moisture freezes, expands and pushes away pieces of concrete.

REPAIR

Clean concrete with medium pressure water wash and bristle brush.
Remove all loose concrete. Remove rust from steel.
Fill cracks with grout forcing mix deep into cracks.
Apply primer or bonding agent as recommended by patching compound manufacturer.
Mix and apply patching compound. See "Sources".
Finish and cure. Do not feather over existing concrete.
Apply siloxane type water repellent.

2.3.1.7 Loss of Concrete (spalling). Rust may be evident.

CAUSE

Entry of moisture due to air pollution. Air pollution reduces concrete's alkalinity and increases its porosity.
Moisture freezes, expands and pushes away pieces of concrete.

REPAIR

Clean concrete with medium pressure water wash and bristle brush.
Remove all loose concrete.
Remove rust from steel and apply primer.
Apply primer or bonding agent to concrete as recommended by patching compound manufacturer.
Mix and apply patching compound. See "Sources".
Finish and cure. Do not feather over existing concrete.
Apply siloxane type water repellent.

2.3.1.8 Loss of Concrete (spalling). Rust may be evident.

CAUSE

Entry of moisture due to use of de-icing salts. De-icing salts create chloride ions which create an electron flow at the steel. This is similar to electrolysis and results in localized corrosion of reinforcing steel.
As the steel corrodes the rust expands and pushes away concrete.

REPAIR

Clean concrete with medium pressure water wash and bristle brush.
Remove all loose concrete and concrete behind reinforcing steel.
Clean steel completely to bright metal, removing all rust.
Prime exposed steel with a high zinc primer all around.
Apply primer or bonding agent to concrete as recommended by patching compound manufacturer.

Mix and apply patching compound behind steel, then in front of steel. See "Sources".

Finish and cure. Do not feather over existing concrete.

Apply siloxane type water repellent.

2.3.2 MAINTENANCE RECOMMENDATIONS

- A. Keep concrete clean.
- B. Remove moss frequently with natural bristle brush and bleach solution.
- C. Avoid impact to concrete.
- D. Avoid the use of de-icing salts.
- E. Clean concrete is less susceptible to loss of alkalinity which leads to an increase in porosity.
- F. Prevention of moss build up also helps in preventing the absorption of moisture.

2.3.3 COMMENTS ON PATCHING COMPOUNDS

For small areas, patching compounds will perform better than a small batch mix of regular concrete. They are formulated for many conditions including:

- Thin applications
- Thick applications
- Congested or narrow conditions
- Extreme climate
- Subject to movement (grouting of handrails)
- Overhead application
- Short setting time
- Self-curing
- Subject to vibration
- Resistance to chemicals
- Reaction to vehicular traffic
- Adhesion to stone

Select patching compounds to suit actual situation. Read label and manufacturer's literature carefully.

See "Sources" for manufacturers.

NOTES

2.4.0 INTRODUCTION

Site personnel and subcontractors may have occasion to mix concrete for small areas such as dumpster pads, equipment pads, doorway slabs, sidewalk patches, fence posts, etc.

This section does not result from evident situations in need of repair, but is included for general use.

It is therefore formatted differently.

Small job concrete should be mixed as near as possible to its final location. Ingredients may come premixed or may be mixed from the following components:

2.4.1 CEMENT

Type I is suitable for most applications. If location is subject to freeze-thaw cycles add an air entraining agent and use a power mixer.

2.4.2 AGGREGATE

1/2" - 1-1/2" clean, hard, durable gravel. Do not use sandstone or flat, elongated pieces. If taken from riverbeds or shorelines wash to remove dirt, loam or salt. Aggregate should not exceed 3/4" for small sections or fence posts.

2.4.3 SAND

A mix of coarse and fine grains up to 3/8"

2.4.4 COLORANT

Add concrete coloring agent if desired to tint new concrete to match old. (A perfect match is almost impossible.)

Wet old concrete to compare color.

2.4.5 JOINT MATERIAL

Provide where horizontal meets vertical.

2.4.6 BONDING AGENTS

Several dozen are available. Use when work is adjacent to existing concrete.

2.4.7 MIX

The mix varies with the intended use. To increase strength increase cement and decrease water.¹

SAMPLE MIX DESIGNS

<u>Kind of Work</u>	<u>Gallons of Water</u>			<u>Cement Sacks</u>	<u>Sand C.F.</u>	<u>Pebbles C.F.</u>
	<u>Damp Sand</u>	<u>Average Sand</u>	<u>Wet Sand</u>			
Sidewalks	5-1/2	5	4-1/4	1	2-1/4	3
Retaining Walls	6-1/4	5-1/2	4-3/4	1	2-3/4	4
Fence Posts	4-1/2	4	3-3/4	1	1-3/4	2
Ornamental Work	4-1/2	4	3-3/4	1	1-3/4	2

2.4.8 FOR HAND MIXING

Load sand in mixing tray.
Spread cement evenly over sand and mix together.
Work in aggregate.
Make a depression in center and slowly add water, pulling mix toward water.

2.4.9 FOR POWER MIXING

Set mixer in shady spot.
Load all of large aggregate and half the water.
Start mixer.
Slowly add sand and cement alternately with the remaining water.
Run for three minutes or until uniformly gray.
Clean drum by mixing large aggregate and water, run, empty, and rinse.

2.4.10 COLD WEATHER

Concrete should be placed when temperature is above 40°. If necessary aggregate and water may be heated to bring the temperature of the mix between 50° and 70°.

2.4.11 FINISH

Screed slightly higher than any adjacent surface.
When stiff, trowel flush with adjacent surface.
Finish to match nearest concrete. Score expansion joints to avoid cracking if area exceeds 10' x 10'.
Joints should form squares, not rectangles.

2.4.12 CURING

Concrete must be kept continually moist for one week.

2.4.13 COMMENTS

For patching, a preformulated patching compound will perform better than a standard concrete mix.

Never fill hollow cast iron with concrete. This promotes rusting on the inside.

2.5.0 GENERAL

A consistent signage system would be beneficial to the overall appearance of the historic district and to Fort Lewis in general. Miscellaneous signage should be discouraged as it adds clutter to the site and decreases the credibility of the organization erecting it.

Building identification signage shall be mounted in a consistent location on the building face. Other signage should be mounted on posts free from the building.

Signage materials, size, mounting, illumination and landscaping should be consistent with the master plan for Fort Lewis. A serif type style should be considered for the historic district.

NOTES

SITWORK
ILLUSTRATION

2.6
CONCRETE PATCH

TOPIC: SITWORK

ELEMENT: CONCRETE PATCH

1. REPAIR

- a. Clean concrete.
- b. Chip broken area at least 1 inch deep, with edges at right angles to surface. Wet surface.
- c. Apply bonding agent if recommended by patching compound manufacturer.
- d. Mix patching compound and install in void.
- e. Screed slightly high to allow for shrinkage.
- f. Trowel flush to match existing finish.

2. MAINTENANCE

- a. Remove moss monthly.
- b. Avoid impact.

3. UPGRADING

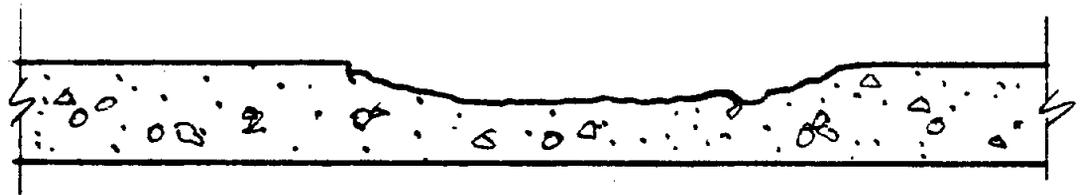
- a. Clean concrete and apply siloxane water repellent.

4. RELATED ILLUSTRATIONS

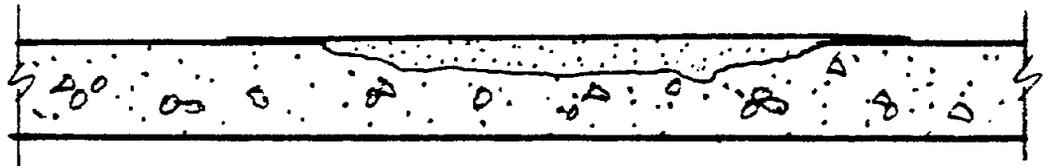
- a. 8.6 Metal Newels

5. RELATED ARTICLES

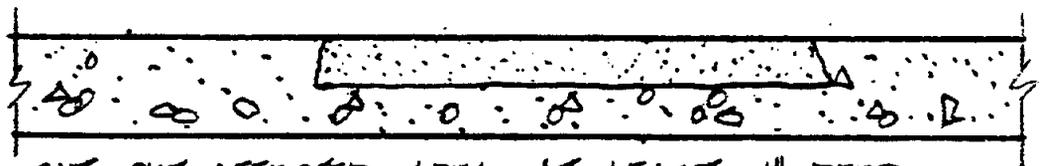
- a. 2.3 Concrete
- b. 2.4 Small Job Concrete
- c. 3.1 Concrete Foundations



CHIPPED OR SPALLED CONCRETE

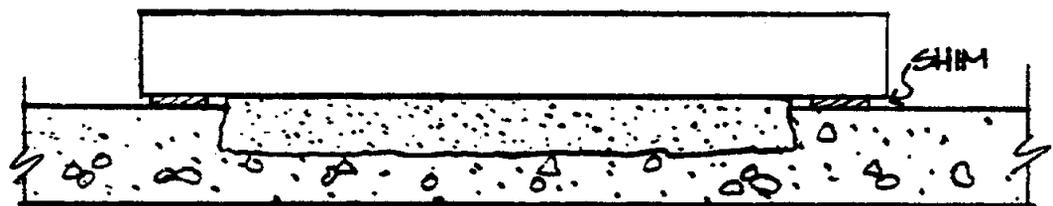


INCORRECT PATCH - FEATHER EDGES WILL BREAK DOWN
THIN AREAS WILL SPALL OFF.



CUT OUT AFFECTED AREA AT LEAST 1" DEEP.
UNDER-CUT EDGES.

CORRECTLY INSTALLED PATCH



TROWEL FLUSH AFTER PATCH HAS STIFFENED

CORRECT SCREEDING

NOTES