Project: test

Date of Substantial Completion:

Architect: Contact:

Building Envelope: Contact:

General Contractor: Contact:

Masonry Contractor: Contact:

Phone no:

Masonry has been used for the most beautiful and enduring structures man has known; their fine quality and durability fulfil the owner's needs perfectly.

Any structure requires regular maintenance after construction and during its performance life. Masonry is susceptible to many of the same pollutants as other building materials, but cleaning and damp proofing must be performed with care and attention to manufacturers recommendations by knowledgeable tradesmen.

Maintenance of buildings may be broken into two general categories: 1) general inspection and maintenance to prolong the life and usefulness of a building; and 2) specific maintenance to identify and correct problems which may develop. This Maintenance Manual addresses both general and specific maintenance procedures. A checklist is provided for general inspections and specific repair techniques are described.

MASONRY UNITS:

Clay Brick:

Manufacturer:

Type and Colour:

Specifications:

Supplied By:

Glass Block:

Manufacturer:

Pattern:

Size:

Specifications:

Supplied By:

Concrete Block:

Manufacturer:

Type and Colour:

Specifications: _____

Supplied By: _____

ULC Fire Rating Certificate No: _____

Stone Work:

Type and Colour: _____

Style: _____

Specifications: _____

Supplied By: _____

Mortar: (list manufacturers)

Type: S _____ N _____

Cement/Lime _____

Masonry Cement _____

Mortar Cement _____

Premixed Mortar _____

Pigment _____

Colour _____

% Wt of Cement and Lime _____

Caulking:

Type and Colour: _____

Specifications: _____

Supplied By: _____

	Cleaning Material (Product, Manufacturer)	Water Repellent Coating (Product, Manufacturer)
Brick		
Natural Grey Concrete Block		
Coloured Concrete Block		
Glass Block		
Stone		

Note: Spec Data Sheets for recommended cleaning materials and water repellent coatings are to be attached.

GENERAL INSPECTION:

A good, thorough inspection and maintenance program is often inexpensive to initiate and will prove advantageous in extending the life of a building. It is a good idea to become familiar with the materials used on a building and how they perform over a given time period.

It is suggested that periodic inspections be performed to determine the condition of the various materials used on a building. These inspections can be set for any given time period, i.e. monthly, yearly, etc. A suggested inspection period is "seasonal" so that the behaviour of building materials in various weather conditions can be noted. Inspection records, including conditions and comments, should be kept on the enclosed form to determine future "trouble spots". Check the Inspection & Maintenance Record for the recommended inspection schedule.

SPECIFIC MAINTENANCE:

General

Problems resulting from moisture penetration may include: efflorescence, spalling, deteriorating mortar joints, interior moisture damage, etc. If one or more of these conditions becomes evident, the direct source of moisture penetration should be determined and action taken to correct both the visible effect and the moisture penetration source. Table 1 lists various problems appearing on masonry due to moisture and the most probable source of moisture penetration. The items checked in the table represent each source that should be considered when such problems occur.

After investigating all of the possible moisture penetration sources, the actual source may be determined through the process of elimination. Many times the source will be self evident as in the cases of deteriorated and missing materials; however, in instances such as improper flashing, differential movement, etc. the source may be hidden and determined only through some type of building diagnostics carried out by a building envelope consultant specializing in this field. In any case, it is suggested to first visually inspect for the self-evident source before retaining a consultant. Once the source is determined, measures can then be taken to effectively remedy the moisture penetration source and its effects on the masonry.

Remedial Cleaning

Moisture penetration is a contributing factor to the formation of efflorescence. Generally, efflorescence is easily removed by natural weathering or by scrubbing with a brush and water. In some cases a weak muriatic acid solution may be used to remove stubborn efflorescence. Improper acid cleaning, i.e., absence of pre-wetting, insufficient rinsing and strong acid concentrations, may cause irreparable damage. Cement is affected by hydrochloric acid (muriatic acid); therefore, if any hydrochloric acid remains on the masonry, the mortar joints may become etched and/or deteriorated. Two types of efflorescence are not water-soluble; one type is a white efflorescence, composed of calcium carbonate. The other is a white or greyish haze, referred to as "white scum", composed of silicic acid or other silica compounds. Each of these two types of efflorescence requires unique removal solutions and the manufacturer of the masonry units and of the recommended cleaning material should be contacted before any cleaning is attempted.

REPAIR METHODS

Sealant Replacement

Missing or deteriorated caulking and sealants in contact areas between masonry and other materials, i.e., window and doorframes, expansion joints, etc. may be a source of moisture penetration. The sealant joints in these areas should be inspected. If the sealant is missing, a full bead of high-quality, permanently elastic sealant compound should be placed in the open joints. If a sealant material was installed, but has torn, deteriorated or lost elasticity, it should be carefully cut out. The opening must be clean of all old sealant material. A new sealant should then be placed in a clean joint. All joints should be properly primed before the new sealant material is applied. A backer rope material should be placed in all joints deeper than 3/4 in. (19 mm) or wider than 3/8 in. (10 mm).

Water Repellent Coating

Water-repellent treatments have to be renewed from time to time because of a gradual deterioration in their efficiency. The first effect is noticed when the surface no longer sheds the water that falls on it. This does not of itself indicate that the treatment has ceased to be effective; the pore surfaces behind the exposed face still retain an adequate degree of water-repellence for some considerable time.

Since the durability depends on the character of the surface and on the conditions of exposure, the frequency of renewal must be determined by experience with the selected water-repellents in the particular circumstances. Renewal is called for when signs of dampness begin to make an appearance, after first checking for other defects. However, it will usually be advisable to renew a treatment that has served its purpose for a reasonably long time, say 5 - 10 years, without waiting for dampness to appear again.

Tuck-pointing Mortar Joints

Moisture may penetrate mortar that has softened, deteriorated or developed visible cracks. When this is the case, tuck-pointing may be necessary to reduce moisture penetration. Tuck-pointing is a process of cutting out old mortar to a uniform depth and placing new mortar in the joint.

Prior to undertaking a tuck-pointing project, the following should be considered: 1) Whether or not to use power tools for cutting out old mortar. The use of power tools may damage the adjacent masonry units. 2) Any tuck-pointing operation should only be done by a qualified and experienced journeyman.

The old mortar should be cut out, by means of a toothing chisel or a special pointer's grinder, to a uniform depth of 3/4 in. (19 mm), or until sound mortar is reached. Care must be taken not to damage the edges of the masonry units. All dust and debris must be removed from the joint by brushing, blowing with air or rinsing with water.

Tuck-pointing mortar should be carefully selected and properly proportioned. For best results, the original mortar proportions should be duplicated.

SUMMARY

This Maintenance Manual has presented procedures to extend the useful life of the building and to retain the original beauty and performance of the structure. It is suggested that regular routine inspections of the building be carried out to determine where future maintenance may be required. All buildings are unique and will experience individual maintenance needs and schedules.

The information contained in this Maintenance Manual is based on the available data, recommendations from the manufacturers and experience of the Technical Committee of the Masonry Institute of B.C. Final decision on the use of this information must rest with the project designer, owner or both.

TABLE 1
Possible Effects and Sources of Moisture Penetration

		Sources of Moisture Penetration									
		Previous Acid Cleaning	Previous Sand Blasting	Plant Growth	Deteriorated Sealants / Caulks	Missing / Clogged Weepholes	Incompletely Filled Mortar Joints	Capillary Rise	Broken / Loose Units	Differential Movement	Missing Flashing
Effects of Moisture Penetration	Efflorescence	♦		♦	♦	♦	♦	♦	♦		♦
	Deteriorated Mortar	♦	♦	♦	♦	♦	♦	♦	♦		♦
	Spalled Units		♦		♦	♦	♦	♦			♦
	Cracked Units				♦	♦	♦	♦		♦	♦
	Rising Moisture					♦		♦			♦
	Corrosion of Backup Materials	♦			♦	♦	♦	♦	♦	♦	♦
	Mildew/Algae Growth	♦			♦	♦	♦	♦	♦	♦	♦
	Damaged Interior Finishes	♦		♦	♦	♦	♦	♦	♦	♦	♦

References

Brick Institute of America
TEK Notes 7 and 7F
National Concrete Masonry Association
TEK Notes 29, 44, 92 and 100
Masonry Institute of America
Marble & Stone Slab Veneer, 2nd Edition
Pittsburgh Corning
Glass Block Products & Design Brochure

MASONRY INSPECTION and MAINTENANCE RECORD

Building: _____ Date: _____ Last Inspection: _____

Location: _____ Inspected by: _____

Recommended Inspection Schedule:
First 2 years - inspect every 6 months
Thereafter - inspect every 2 years

	OK	Problem		Location/Observation	Date of Repair
		Minor	Major		
1. General Condition					
- General appearance					
- Efflorescence					
- Physical damage					
- Settlement cracks					
- Expansion/Contraction					
- Graffiti					
- Dirt and stains					
- Other					
2. Masonry Units					
- Cracked units					
- Spalling					
- Loose					
- Out of alignment					
- Other					
3. Mortar Joints					
- Missing/clogged weepholes					
- Clogged vents					
- Deteriorated					
- Cracks					
- Moss/algae growth					
- Other					

4. Flashing					
- Damaged or missing					
- Corrosion					
- Correct slope					
- Open joints					
- Stains					
- Other					
5. Caps/Coping					
- Cracked Units					
- Loose joints					
- Open joints					
- Not flashed beneath					
- Attachment					
- Other					
6. Water Repellent and Caulking					
- Deteriorated/torn caulking					
- Masonry to masonry					
- Masonry to doors and windows					
- Masonry to flashing					
- Loose/flaking paint					
- Efflorescence					
- Water Stains					
7. Other Observations					